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# **NEW HORIZONS IN AGRICULTURAL INFORMATION MANAGEMENT**

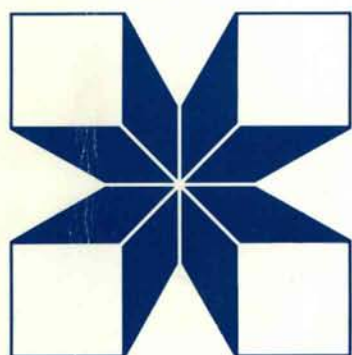
PROCEEDINGS

OF AN INTERNATIONAL SYMPOSIUM

MARCH 13-16, 1991

BEIJING, CHINA

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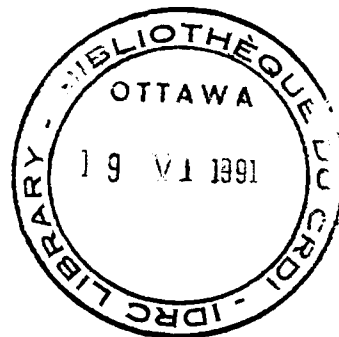
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# **New Horizons in Agricultural Information Management**

**Proceedings of an International Symposium,**

**March 13-16, 1991, Beijing, China**



**Compiled and Edited by**

**Gary K. McCone**



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# Prospects for the Chinese Agro-library and Information Education

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## **Abstract**

*Reviews the forty-year development of agro-library and information education in China, and point outs that information education is facing three major changes: 1. Improving efficiency of information service, 2. Socialization of agro-library information service, and 3. Formation of an information industry. According to the Theory of Dissipative Structure, the library and information education system is an open system, with order-arranging as the core of its development. Hence a library and information education system must be a stable formalized system. It is suggested that in order to strengthen agro-library information education in the future, the following three measures be taken: 1. Training in information ideology and ability; 2. Adjustment of structure in agro-library and information education; 3. Enrich the courses of agro-library and information education and to closely integrate the education with social practice.*

Through forty years of difficult development, education in library science in China has gradually taken its own shape suitable to the Chinese conditions. However, with the advancement of science and social development, Chinese education in library and information science is facing competition from new knowledge and intelligence. It is worth discussing how we can keep pace with the new situation; how we can apply modern scientific methods to study the optimization of the education system of agro-library and information, and the future trend of agro-library and information education.

## **1. How to Keep Pace with the Change of Agro-Library Information Education**

In the late 1940s and the early 1950s, there was only a special course of library science in China (China Science and Technology University set up a Department of Information Science in 1959). Since Wuhan University established a Faculty of Science and Technology Information in 1976, some other colleges and universities of liberal arts, science and engineering have followed suit. Now more than twenty colleges and universities have opened up or are prepared to open up a Faculty of Agro-Library and Information Education. However, agro-library and information education was started quite late. It was in 1986 when a Department of Library Science was first set up in Najiang Agricultural University. Most of the agricultural universities now have opened courses in document retrieval, and some have offered scientific information lectures for both senior and graduate students.

By 1985 there were eighty educational institutions in China that had courses in library science, of which 47 had regular education while 33 had in-work education. Library science education in China is still young, it lacks experience in training orientation, in schooling methodology, and in personnel ability. The education of library science in China should keep pace with the changing situation in the following three aspects.

**(1) The traditional method of manual service for documents needs must change into a highly efficient service of online retrieval from databases**

Nowadays the quantities of databases are increasing rapidly in developed countries. Nearly a hundred per cent of citations to documents are stored in a database, and quite a lot are replicated in different databases. In recent years the storage of information using CD-ROM has been developing rapidly. The United States, Japan and Western Europe are planning to build systems for storing full patent documents using CD-ROM. It is expected that by the year of 1990 patent documents all over the world will be able to be searched through international communication lines. In face of such a situation, Chinese library and information education should readjust its training orientation, teaching program and personnel qualification norms. It is necessary to foster a group of information professionals who are good at information processing to keep pace with the rapid development of information technology. Meanwhile the professionals who are engaged in library and information services should be reeducated so that they can renew their knowledge and become better qualified.

**(2) Socialization of Agro-Library and Information Service**

With the deepening of rural economic reform in China, the Chinese peasants are more enthusiastic for developing commodity production. They are eager to learn science and learn how to use information. This situation compelled the agro-library and information workers to extend their service scope from scientific information to information on market, management and economy. Furthermore, in order to transfer the information into productive force and gain social and economic effectiveness, it is necessary to change the means for storing materials to make them useful for township enterprises and private householders in vast rural areas. Therefore we should train different kinds of information professionals, taking into account the requirement that library and information education should serve eight hundred million Chinese peasants.

**(3) Formation of Information Industry Concept**

People usually consider information as a new industry of the 21st century. There are two concepts to explain why information is an industry. First: the product of an industry should be a commodity, and the commodity must have values of utilization and exchange. Information reflects such values through delivery or exchange, while delivery or exchange is exactly the fundamental property of information, therefore information is a commodity; second, information can not be produced in a small-scale and closed way. It requires large-scale, cooperative production. The formation of an information industry breaks the long-standing idea that an information institute should offer its service freely. Information should become an essential social industry. It remains to be discussed how future library and information education can be suited to such new changes.

## **2. System Ideology in Library and Information Education**

Mr. I. Prigogine, the initiator of the dissipative structure theory believed: in an open system far from equilibrium, quantitative changes may cause qualitative changes when its external condition reaches a certain threshold value. The continuous exchanges of energy and substance between a system and its environment will transform a system in a non-orderliness state in space, time or function to an orderly and stable one. From this principle, the following aspects must be analyzed in order to change the library and information education system into a stable and orderly one.

### **(1) Library and Information Education System---An Open System**

The theory of dissipative structure holds that only opening up makes the exchange of energy, substance and information with outside world possible, that is the transformation from non-orderliness to orderliness. If it is an isolated and closed system, the entropy value certainly becomes larger, which will create confusion among the component parts of the system and will increase internal waste, namely the transformation from orderliness to non-orderliness. The opening up of an education system means: a) looking to the rest of the world in order to learn and use the educational experience of other countries better, to understand the new trends in science and technology, in library and information sciences, as well as the developing level and trends of agricultural science; b) education should break from the present situation in China in which education is divorced from society and should apply the knowledge and skill acquired in school to practical use.

### **(2) Order-Arranging Core to the Development of Library and Information Systems**

The theory of dissipative structure discusses the mechanism, conditions and regulations that evolve a system from a confused and non-orderliness state to a stable and orderly state. If the library and information education system needs a stable and continuous development, the function of its subsystem should be in a stable and coordinated state to bring the coordinated effect of the subsystems into full play. The education system for agro-library and information should train its personnel with different educational levels, the junior, middle and senior levels. They should attain not only knowledge of agriculture but also knowledge of information. The form of schooling can be divided into regular, spare-time, self-taught, or training courses, if agro-library and information education is regarded as a system, the schools with different training targets and administration are its subsystems. The coordination among the subsystems is the core to order arranging.

### **(3) The Library and Information Education System Should be Far from Equilibrium State**

According to the theory of dissipative structure, the state far from equilibrium means non-equilibrium of thermodynamic or non-equilibrium system but in the agro-library and information education system it means: a) non-equilibrium on the information quantity of teaching material, that is to say the teaching material should be updated continuously to meet the demand because agricultural science and technology are

advancing and the technological revolution in information science is rising; b) non-equilibrium on teaching methods, the present educational system needs new teaching methods but it is limited by traditional ideas and education levels, thus causing non-equilibrium; c) society needs a large quantity of agricultural information and has a more strict demand on information professionals, but the agro-library and information education is unable to meet those requirements, which also causes non-equilibrium in the library and information education system.

These further confirm that the library and information education system, just like other systems, also has the characteristics of dissipative structure. If the combined effect of its various subsystem are in full play, to the optimum result, the educational system will finally reach a new and stable orderly state, which will promote the advance of library and information education progressively.

### **3. Agro-Library and Information Education in the Future**

Agro-library and information service is a very specialized and synthesized area and covers many subjects, so it has more strict demands on the qualifications of personnel. At present, the problem lies in students. Those who study agriculture lack knowledge of library science while the students specializing in library science have little knowledge of agriculture. Therefore, there are no qualified personnel to meet the social requirement. It is necessary to enhance students in the following aspects for overcoming these weak points.

#### **(1) Training of information ideology and ability**

Because of weak information ideology in the long past the social status of library and information service is very low. Historically, the Chinese library and information service copied indiscriminately the experience of the Soviet Union in the early 1950s, without training students in information ideology. To thoroughly overcome this weak point, we should start with the education in information ideology for the students by holding lectures on domestic and foreign developments in agricultural science and technology, on the future of agriculture, on fundamental knowledge in information science, as well as lectures on other intersecting and cross-related disciplines. These lectures can not only train students in information ideology but also widen their range of knowledge.

Information ability means the ability for people to access, analyze, use, and judge information acquired from computer terminals. Information ability is essential to future university students. Its training contents include: 1) the ability of collecting and sorting, which means the selection of useful information from hearsay, acquiring materials and documents, and then distinguishing and sorting them out; 2) the ability of thinking and judging, which means the process of judgment and absorption on the basis of collection and sort; 3) the ability of comprehensive expression, which means the ability to express information before inducing, analyzing and feeding back. Except for the arrangement of lectures on theories of information application and information technology and on information forecasting, the training of information skills should

also include out-of-class information surveys, training students with information ability through practice.

## **(2) Adjustment of Structure in Future Agro-Library and Information Education**

### **(i). Adjusting the norm of qualified personnel**

Different personnel should receive different training. The assignment of trained personnel should be strictly managed to prevent improper use of qualified personnel. Graduate students who are trained for strategic research and forecasting of agricultural information, and have the ability of invention are senior professionals while undergraduate students, trained in the application of agricultural information and management to the engineering of information systems are middle-level professionals; and students from polytechnic schools are junior professionals mainly engaged in service management such as audio/video services and computer operation.

### **(ii). Adjustment of education structure**

We must have a reasonable proportion of senior, middle and junior professionals in developing the education scale. According to foreign reports, the general proportion in the information field was 1:2:4, while the proportion in China was 1:10:5 based on the statistics of information professionals in 27 provincial agricultural academics. Such a proportion means that many middle-level professionals were engaged in ordinary work. Only when a pyramid structure is formed, would the optimum professional structure be obtained.

### **(iii). Adjustment of form of schooling**

The form of schooling requires both regular education and reeducation systems. The regular education system should be developed systematically. It is suggested that the Library and Information Education College of Wuhan University, which is the Training Center for Library and Information Education under the State Commission of Science, should assist agricultural universities to set up a faculty of agro-library and information, so they can increase their enrollment. Meanwhile reeducation should not be neglected because it has flexible and purposeful characteristics and becomes an indispensable part of future education.

## **(3) Teaching Courses and Methods for Future Agro-Library and Information Education**

The content of courses in the faculty of agro-library and information education varies with its different training levels. Usually the courses are divided into information research and management, engineering of information systems, processing of information and information technology. The courses should also include agricultural subjects, such as outline of agriculture, genetics and breeding etc. Considering the fact that the faculty of library and information education in the future will require a wide range of knowledge, some courses related to other faculties and the Education of Modern

Methodology need to be arranged to enrich the content and widen the range of knowledge. The application of an open teaching method in which education is closely integrated with social practice gives students an opportunity to acquire and process their information. When the information investigation course is arranged, students can take part in special observations and social investigations, write various information papers, go to the countryside to pass on information and offer information advice, and can enhance their ability in analyzing and solving problems they encounter in practice.