AGRIS

AGRIS is an international information system for the agricultural sciences and technology.

Joseph F. Caponio and Leila Moran

The rapid growth of scientific and technical information has caused many countries, governments, and other authorities to become conscious of the role of information in the social and economic development of nations. An intergovernmental conference convened in 1971 by the United Nations Educational, Scientific, and Cultural Organization reviewed the lack of awareness on the part of researchers and scientists of recent developments in all disciplines and concluded that the problem might be solved through international cooperation. The conference endorsed the principles of and guidelines for such cooperation in the form of UNISIST, a World Science Information System (*1*, p. 2).

International cooperation in the collection and dissemination of information is already under way in the fields of chemistry, physics, medicine, and nuclear energy. In agriculture and allied subject areas, however, the situation is, on the whole, unsatisfactory. Despite a constantly growing number of information and documentation centers, and considerable duplication of efforts and costs, the coverage of agricultural literature (in all its forms, subjects, and languages) is still incomplete, and adequate services are still lacking (*1*, p. 2). This is very apparent in the area of biological agriculture. Within this area (which includes forestry, fisheries, nutrition, and rural development, for example) the volume of information is constantly increasing —more than 200,000 new documents are produced each year (*2*, p. 1). This figure includes published documents, such as books and journal articles, and unpublished ones, such as meeting papers, project reports, theses, and research papers.

Need for Cooperation in an Agricultural Information System

Only a sustained and coordinated effort at the international level can ensure the proper processing and dissemination of this knowledge for the benefit of all users.

Many countries and institutions have come to realize that the gathering and processing of agricultural information has grown into a task of enormous proportions that is beyond the manpower and financial resources of single institutions or even sole countries. The pooling of resources on an international level with a coordinated sharing of responsibilities offers definite advantages, and the idea of establishing an international information system for the agricultural sciences has been stimulated by developments within certain long-established institutions in the agricultural information area.

Both the National Agricultural Library in the United States and the Commonwealth Agricultural Bureaux in Great Britain have studied the impact of automation upon their literature services. In 1969 it became evident to these institutions that their traditional structures required reorganization in order to expand resources through mechanization (*3*). It also became evident that cooperation between national agricultural information and documentation centers in other countries would substantially reduce costly duplication in both the acquisition and dissemination of information. A survey of world agricultural documentation revealed the existence of more than 700 documentation and information services (*2*, p. 2). None of these services, large or small, general or specialized, can deal adequately with the growing volume of information. A large proportion of published literature is unavailable to users and unpublished documents are largely ignored.

The Role of the FAO

That the Food and Agriculture Organization (FAO) of the United Nations has a responsibility in the area of information dissemination is clearly defined in article I.1 of the FAO constitution, which prescribes that "The Organization shall collect, analyze, interpret, and disseminate information relating to nutrition, food, and agriculture." The FAO must, in order to discharge its responsibility, ensure that information in the agricultural sciences and technology is made available as quickly and as widely as possible (*2*, p. 2).

A group of experts in the European Economic Community (EEC) took up the study of requirements for a bio-agronomic documentation system for member states of the EEC in 1970 (*3*). In the same year, a similar proposal for a study leading toward the creation of an international information system was being made to the FAO by representatives of the Commonwealth Agricultural Bureaux and officials of the FAO. The efforts of the two groups were joined, and a panel of experts was selected by the Director-General of the FAO. An informal meeting was held in Paris, in April 1970, during the Congress of the International Association of Agricultural Librarians and Documentalists. The first official meeting of this panel took place in Rome in July 1970 (*4*).

The panel recommended that the FAO establish an International Information System for the Agricultural Sciences and Technology, to be referred to by the acronym AGRIS. The aim of AGRIS would be to encourage and sponsor all nations contributing to the FAO to take the responsibility for the provision of both input and output services, based on their own needs and facilities. The panel recommended that the system should be sponsored and coordinated by the FAO, and established a study team to examine the ways and means of bringing the system into being (*5*, *6*).

Dr. Caponio, formerly acting director of the National Agricultural Library, is now the director of Environmental Science Services, National Oceanic and Atmospheric Administration, Washington, D.C. 20235. Leila Moran is information officer at the National Agricultural Library, U.S. Department of Agriculture, Beltsville, Maryland 20705.

The AGRIS Study Team

The AGRIS study team reviewed in 1970 and 1971 the need for and general feasibility of establishing an international information system for agriculture, and determined that the system should be structured on two levels, to be known as level I and level II (*5*). In AGRIS level I, a comprehensive and rapid documentation service would provide an index of current information in all fields of the FAO's responsibility. The language of the system would be English. In AGRIS level II, a network of specialized services, some of them already existing, would be provided. Specialized information centers, analysis centers, and data banks would be utilized, and AGRIS level II would have the responsibility of obtaining and disseminating information in depth in particular subject fields (*1*, pp. 2 and 4). The services would provide specific retrospective information through abstracts and deep indexing, for example.

It was agreed that a specific language could not be imposed on level II. English would be the principal language with each national center using its own language.

Three groups were established to assist the study team on special problems. The first group, in charge of system development and management procedure, has the responsibility for overall system design, interactions between AGRIS levels I and II, and selection of input and processing centers, budget, contractural policy, and related matters. The second group, responsible for processing and output, is concerned with mechanization, input formats, output media, and selective dissemination of information services. The third group, responsible for subject control, investigates the coverage of the system, makes priority lists of periodicals, and studies the development of category lists, subcategories, and relationships with a thesaurus needed for AGRIS level II. This group will not prepare a thesaurus, but may make recommendations for establishment and maintenance.

A detailed feasibility study by another international team of experts was conducted in 1971 to define the objectives of AGRIS more closely and to propose mechanisms by which these objectives might be accomplished. A report was made by the Director-General of the FAO to the general conference of FAO in November 1971 on these studies and their results (*5*, p. 2).

AGRIS Objectives

The objectives of AGRIS would necessarily be related to economic and social developments. In a forecasted era of shortages, attention must be paid to raising levels of nutrition and achieving efficiency in the production and distribution of food and all other agricultural products. Never in world history have so many peoples enjoyed the good life, yet there are still whole urban and rural populations for whom conditions and standards of living must be raised. Accomplishment of these objectives would contribute to the expanding world economy and address the problem of world hunger to ensure humanity's freedom from this evil. The establishment of AGRIS by the FAO is a step toward the accomplishment of these objectives.

The people who will benefit most directly from AGRIS will be found in both the private and public sectors. On the governmental and industrial level are the policy-makers, the managers, and administrators implementing policy. In education and concurrent research are the scientists, researchers, teachers, and students. Investors, agricultural extension workers, farmers, and others will benefit from coordinated efforts toward the control and dissemination of agricultural information. Up to now, they have been deprived of data essential to their activities. Knowledge accumulated through research, studies, surveys, and other means has remained largely untapped. Opportunities to apply accumulated knowledge have been missed, while institutional resources have been diverted to repetitious research and studies.

At the general conference of the FAO in November 1971, the Director-General was invited by a unanimous resolution to pursue the AGRIS objectives and seek the necessary support from governments, institutions, and other interested bodies for the further study and implementation of the system.

Implementation of AGRIS

During 1972 and 1973, active plans were made to implement AGRIS level I. To compile the index, both printed matter and information stored on magnetic tape would be used. All member countries of the FAO were called upon to cooperate in providing "input" in the form of current information on their agricultural documentary production.

The system is being built initially on input from existing centers. Provision has been made for the progressive enlargement of the input, with emphasis being put on nonconventional material from national input centers. Responsibility for coverage of documents published in various areas of the world and in many languages is divided by common agreement among the cooperating national input centers. However, the processing and merging of input from various sources will be accomplished at a central point. The collection and merging of bibliographic information and the production of primary bibliographic services are to be coordinated at an FAO center under the guidance of an advisory body consisting of representatives of contributing organizations and groups of users.

AGRIS Level I

Tangible evidence of progress in implementing AGRIS level I is the 600-page experimental issue of *AGRINDEX* containing citations contributed from nine national information centers, including the National Agricultural Library. The printing of *AGRINDEX: Experimental Issue* was completed in September 1973, and copies were distributed to documentation centers, libraries, research institutions, ministries of agriculture and ministries of foreign affairs of FAO member nations, and various other organizations and individuals who would be likely to benefit from the service (*7*, p. I).

This issue contains nearly 7000 entries from a worldwide sample of current conventional and nonconventional literature. The higher proportion of citations are to conventional literature. Although it was originally intended to index all journals reviewed for the sample cover to cover, in a minority of cases, this did not prove possible. A list of the journals from which items were selected for this experimental issue is included in *AGRINDEX*. Other types of documents cited are monographs, reports, conference proceedings and papers, theses, legislative acts, and maps. The goal was to develop a prototype for a current awareness tool to be published monthly, with approximately 6500 citations per issue.

Among the institutions and countries that contributed to the experimental issue of *AGRINDEX* were the following (*7*, pp. I–II): the Commonwealth

Agricultural Bureaux; the Czechoslovak Socialist Republic (Ustav Vedecko-technickych Informaci); the Inter-American Center for Agricultural Documentation and Information (Inter-American Institute for Agricultural Sciences); the Commission of the European Communities; Japan (Agriculture, Forestry, and Fisheries Research Council); Morocco (National Documentation Centre); the United States of America (National Agricultural Library); and the Union of Soviet Socialist Republics (The All-Union Institute of Scientific and Technical Information and Economic Research in Agriculture).

AGRIS level I should become fully operational in January 1975, with *AGRINDEX* being published regularly once a month thereafter. This phase will be made possible by contributions in cash or in kind (input data, processing services), or both, from a small group of main input centers, organized on the basis of cooperation by groups of countries. The FAO and other institutions will provide technical assistance to those countries interested in establishing or strengthening their national documentation centers in agriculture.

Systems specialists meeting in Vienna, in March 1974, established a schedule of actions required for publication of the first regular issue of *AGRINDEX*. In accordance with this schedule, the national centers participating in the system have been submitting sample magnetic tapes containing about 100 items, upon which the development of procedures for regular input will be based by the participating center in Vienna. The first regular input tapes were scheduled to be forwarded to Vienna in the autumn of 1974 for merging and processing. Volume 1, number 1, of *AGRINDEX* is scheduled for issuance in January 1975. Various organizations represented at the fifth meeting of the specially created AGRIS implementation advisory group at the FAO headquarters, Rome, in May 1974, indicated their capacities to meet this schedule. Assuming receipt of funding, the group agreed to recommend that AGRIS be initiated on the basis of the proposed schedule, realizing that the first issues would of necessity be thin until all participants were actually contributing fully.

The AGRIS Coordinating Center prepared and distributed three basic manuals in 1973, with the advice and guidance of the panel of experts and the implementation advisory group (*8*). These manuals were used as the basic texts in the production of the experimental issue of *AGRINDEX*. They will be open to modification and revision in accordance with evaluations of the experimental issue and the expressed wishes and capacities of contributing national institutions associated with the future development of AGRIS.

Further steps recommended by the panel of experts for the implementation of AGRIS level I include the following (*5*, p. 2): (i) Continuation of the preparation of a list of priority journals. (ii) Preparation of guidelines for the inclusion and selection of conventional and nonconventional literature. (iii) Preparation of a definitive document describing the scope of the system. (iv) Amplification of the output services which might be provided nationally and regionally. (v) Design and specification of additional overall systems related to the resources and facilities of the network of bodies participating in the system. (vi) Further studies on the interaction between level I and level II which, because of time limitations, could not be fully explored by the AGRIS study team.

AGRIS Level II

AGRIS level II is envisioned as a network of specialized information centers, data banks, and data analysis centers, with responsibility in depth for particular subject fields.

The specialized services planned for AGRIS level II would be grouped by subject field or mission and would provide information in depth in response to specific requests from users. The role of the FAO would be that of a coordinator of the activities and relationships among subject-related centers.

Discussions on the organization and development of AGRIS level II were opened in Rome, in May 1972, at the fourth session of the panel of experts (*9*). The organizational concept was viewed as sectorial. The problem assigned to the level II study team was to define a specialized center and to conceive of a network of such centers. The primary task of specialized centers would be the regular selection of articles from periodicals both in specialized fields of interest and in fields of marginal interest.

Two approaches to the linking of the specialized centers were considered: (i) centers could be grouped according to the disciplines that they would be most concerned with, attempts being made to cover all fields of interest, or (ii) the existing documentation centers could be organized without concern for gaps in given fields of science covered by AGRIS.

The panel of experts at its November 1972 meeting recommended that before the implementation of AGRIS level II (*10*) there should be an overall study to define the general pattern of the network and the organizational characteristics from the points of view of both the users and the system organization, and specific studies of existing, developing, or desirable networks of specialized services in the agricultural sector to substantiate the results of the overall study.

The main activity of AGRIS level II was viewed by the panel of experts as being preparation and dissemination of abstracts through bibliographic and abstracting services. Three fields, veterinary medicine, forestry, and tropical agriculture (*11*), were selected as areas for pilot projects in this endeavor. Consideration would also be given during the pilot stages to the development of information analysis centers.

The *Inventory of the World Agricultural Documentation/Information Services*, which covers some 600 information centers and was compiled by the Centre d'Information et Documentation des Communautes Europeennes in collaboration with FAO, provides detailed information on the fields, languages, and literature covered and services provided by these information centers. This inventory will be used in planning the development of AGRIS level II (*11*).

Relationships with Other Systems

The establishment of working relationships with concurrently developing international systems, such as AGLINET (Agricultural Libraries Information Network) and CARIS (Current Agricultural Research Information System) is encouraged as being instrumental to the development of AGRIS (*9*, p. 5). Libraries play a fundamental role as sources of information for users: this role needs to be reinforced through better use of existing and developing information systems. AGLINET was established within the framework of the International Association of Agricultural Librarians and Documentalists (*11*) for the purpose of organizing at regional and international levels cooperation among agricultural libraries. The AGRIS system will benefit agri-

cultural libraries through bibliographical control of the literature, since many such libraries do not have the means to identify and catalog the articles in the technical periodicals they receive. Furthermore, AGRIS users will have access to the documents cited in *AGRINDEX* through their own libraries, because of the AGLINET system. The National Agricultural Library at Beltsville, Maryland, has officially agreed to participate in AGLINET.

CARIS is a pilot project covering West Africa. It has published two directories (one in English, the other in French) which contain data collected by participants in the project on 237 agricultural research institutions and stations, and on 1555 agricultural research projects (*12*).

The services provided by AGRIS level II will be numerous, and they will be oriented to the interests of the scientists they serve. Among the many services of level II will be the provision of data and reviews of the state of the art; identification of research in progress and of research required to fill in gaps in knowledge; the production of a journal, both for news and for original publication of scientific papers on agricultural topics; and an "answer to questions" service for individual clients.

Discussion

AGRIS represents the first big international effort to coordinate and to consolidate a spectrum of information activities. It will attempt to find mechanisms that will avoid duplication and fill necessary gaps in subject coverage. Since its inception, a growing interest and support for AGRIS has developed on the part of governments, institutions, and other bodies. Valuable support in kind or in cash (in the form of experts, methodological experience, assistance for meeting input and processing assistance, and contribution of studies) has been and is being provided to AGRIS by individual countries, groups of countries, institutions, and institutional organizations.

While the role of the FAO governing bodies in AGRIS will be one of overall policy and program development, management and financial control, progress review and promotion, the role of the FAO secretariat at both AGRIS levels is to be mostly limited to sponsorship, overall coordination, systems development and maintenance, liaison with other international systems, and a forum for studies, negotiations, and agreements. The FAO will naturally also contribute to AGRIS input (related to its own documentation) as well as technical assistance in setting up national documentation centers in agriculture in developing countries (*12*).

Establishment in the United States of a single massive information system to handle all scientific information would probably meet with small success, given the American distrust of centralization of power. The preferred approach is cooperation among the many existing information services and programs; not a single network but a changing overlapping system of many networks. An informal network of agricultural information agencies already exists. Libraries and specialized information centers in land-grant universities, the U.S. Department of Agriculture, and other organizations in related fields cooperate with each other closely.

In order to establish closer cooperation and improved efficiency among all these units, the National Agricultural Library has established the National Agricultural Libraries Network (*13*). This network will link through formal agreement the libraries of 69 land-grant universities, a number of large public libraries, and some of the large U.S. government libraries in a nationwide system. It is designed to provide a structure and resources for a more systematic growth of cooperative efforts, access to information resources, and improved services to the scientist and researcher.

Despite limited publicity, AGRIS has influenced and encouraged the development of national and regional agricultural schemes and studies. For example, the U.S. Forest Service is participating in the development of the AGRIS forestry network. This network is conceived as a central computerized data bank linked with a number of large forestry documentation centers also using computers. Each of these centers may be linked to a number of smaller local information centers that may or may not use computers. Clients or subscribers to AGRIS forestry will be able to obtain services from any of these centers depending upon geographic locations, communication facilities, and languages employed. AGRIS forestry will utilize relevant documented material from all parts of the world. AGRIS, therefore, can serve as a useful catalyst of, and frame of reference for, the present trends and efforts in the agricultural information sector.

The National Agricultural Library has a major role in the development of AGRIS level I. Participation in the production of *AGRINDEX* means a heavy investment of resources in different tape formats, methods of literature coverage, and altered internal procedures. Improvements in bibliographic techniques will eventually result, but the immediate concern of the library is to avoid any degradation of current products and services. In addition, the library has the responsibility for developing a coherent federal policy regarding AGRIS and for working with various organizations, such as the U.S. Forest Service, that can provide information and services related to particular subject areas covered by AGRIS. The National Agricultural Library will also help to develop a clear conceptual pattern for the implementation of AGRIS level II.

References and Notes

1. FAO Council, 60th Session, *International Information System for the Agricultural Sciences and Technology* (AGRIS), Document No. CL 60/18 (FAO, Rome, 1973). The FAO (Food and Agricultural Organization, United Nations) documents cited below are available from FAO Documentation Center, Via Delle Terme di Caracalla, Rome.
2. FAO Conference, 16th Session, *Note on the Proposed International Information System for the Agricultural Sciences and Technology* (AGRIS), Document No. 71 INF/13 (FAO, Rome, 1971).
3. P. Aries, *Inter. Assoc. Agric. Lib. Docum. Q. Bull.* **16** (No. 1), 3 (1971).
4. Represented on this panel were producers of agricultural information, users of general documentation, the industrial countries of Europe and Latin America, and several developing countries.
5. FAO Document Center, *International Information System for the Agricultural Sciences and Technology* (AGRIS) *Study Team Report* (FAO, Rome, 1971).
6. FAO Conference, 16th Session, *Programme of Work and Budget, 1972–73*, Document No. C71/LIM/59 (FAO, Rome, 1971), p. 2.
7. *AGRINDEX: Experimental Issue* (FAO, Rome, 1973).
8. The three manuals prepared by the AGRIS Coordinating Center were as follows: *AGRIS Guidelines for Bibliographic Descriptions*, FAO/AGRIS Publ. No. 4; *AGRIS Subject Categories and Scope Descriptions*, FAO/AGRIS Publ. No. 3; and *AGRIS Serials Recommended for Cover-to-Cover Treatment*, AGRIS/Implementation Advisory Group 3/36.
9. FAO Panel of Experts on an International Information System for the Agricultural Sciences and Technology, 4th Session, *Summary Report*, Document No. AGRIS/Panel/4/REP (FAO, Rome, 1972).
10. FAO Council, 59th Session, *International Information System for the Agricultural Sciences and Technology (AGRIS)*, Document No. 59/15, Suppl. 1 (FAO, Rome, 1972).
11. FAO Conference, 17th Session, *ibid.*, Document No. C73/18 (FAO, Rome, 1973).
12. FAO, *AGRIS Information*, No. 6 (1973), p. 3.
13. J. Sherrod, *AALDI Bull.* **1**, 2 (Jabalpur, India, 1973).