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AGRICULTURAL INFORMATION NEEDS AND SERVICES TO DEVELOPING COUNTRIES

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EXECUTIVE SUMMARY

This report serves as a background document for use in the development of a Memorandum of Understanding (MOU) between AID's Office of Agriculture (S&T/AGR) and the National Agricultural Library (NAL), and in addressing issues relating to the agricultural information needs of individuals working in developing countries. Included in this report are an overview of LDC and mission agricultural information needs, descriptions of existing services and recommendations for their improvement, and identification of new initiatives for the timely dissemination of needed information. A draft MOU, to be used by S&T/AGR as a discussion document for development of an appropriate MOU with NAL, is provided in Annex B of this report.

A number of activities are recommended for S&T/AGR and NAL, based upon interviews with knowledgeable individuals concerned with agricultural information, review of relevant documentation, and the professional experience of KRI project personnel in agricultural information work related to developing countries. These recommendations range from broad, long-range projects to specific actions that can take effect immediately with little or no cost to NAL or AID.

The recommendations are presented as several major activities, with respective related activities. Order of magnitude costs for implementation of some of these recommendations are included below. Other recommendations require considerable analysis before cost estimates can be made.

1. Creation of a new position of International Agricultural Liaison for Information Systems is critical to the success of any cooperative venture between S&T/AGR and NAL and essential to the successful implementation of the activities recommended below.

   Estimated cost: $38,000 p.a. + benefits, overhead, travel

The Liaison will:

- ensure close coordination between the agricultural information activities of AID and NAL, including the activities of AID-funded agricultural information centers;

- maintain close communication with appropriate agriculture specialists in other Washington-based organizations which are part of the international development community in order to coordinate their agricultural information services and products with those of AID and NAL;

- work with appropriate NAL staff to develop standards, guidelines, procedures and service policy recommendations for the establishment of new AID-funded information centers. Closer coordination between these centers and NAL should be achieved to provide improved bibliographic control of each center's publications and to avoid duplication of effort and incompatibility of programs/services;

- explore alternative mechanisms to enable efficient purchasing of commercial and other publications by mission staff;

- solicit donations of information materials from active and retiring AID staff who may have accumulated collections of relevant materials from developing countries. This activity can be expected to increase the bibliographic control of the AGRICOLA database;

- investigate the means by which AID staff can donate information materials to LDC libraries through NAL's Exchange and Gifts Division;

- review short courses provided by USDA/OICD and plan and/or design new courses to train LDC and mission librarians, and agricultural researchers in LDCs. Also review existing courses that would benefit from inclusion of a library/information component;

- conduct regular surveys of AID missions to identify subject interests, LDC agricultural information needs, and to obtain input for NAL's planned "Agricultural Organizations and Meetings" database;

- write a regular column or insert of international interest for inclusion in NAL's newsletter, Agricultural Libraries Information Notes;

- evaluate the most effective means of exploiting NAL's Translations Program to benefit AID mission staff.

2. A closer integration of the AID-funded Agricultural Information and Exchange System (AGIES) Project services with existing and planned services of NAL should be achieved. In particular:

- the expertise of NAL reference staff should be utilized to produce "Quick Bibliographies," while AGIES services should concentrate on current awareness, retrospective database searching, and document delivery;

  Estimated cost: "Quick Bibliographies" -- $400 per title (300 copies)

- to speed communications with field missions, the use of electronic mail and long-distance telephone calls for transmission of mission requests and development of SDI profiles should be investigated through the establishment of a pilot project. The most cost-effective approach to communications should be determined;

  Estimated cost: $5,000 (assumes selection of a mission with a communicating microcomputer)

- the use of telefacsimile for improved document delivery to field missions should be investigated through the establishment of a pilot project;

  Estimated cost: $10,000 per mission included in the pilot

- the value and feasibility of producing a journal contents page distribution service for mission staff should be assessed; this service would supplement the AGIES current awareness searches.

  Estimated cost: $7,500 per year (100 journals)

3. Investigation should be made of the usefulness of new document delivery services, such as UMI's Article Clearinghouse or ISI's The Genuine Article, including deposit accounts, volume discounts, direct fulfillment of requests to missions, and potential electronic delivery of requested articles. Negotiations should be initiated as soon as possible to ensure that an appropriate core set of frequently-requested journal titles are included in the document base of the provider(s) selected.

   To be undertaken by the Liaison during Year 2. No estimated costs available at this time.

4. The use of new laser-encoded disk technologies for future distribution of databases (e.g., AGRICOLA, the NAL catalog) and training courses should be explored. Pilot testing of new products and integrated workstations in mission libraries as well as in S&T/AGR should be planned.

Estimated costs:

- $10,000* per site for set-up and access to one year of AGRICOLA on CD-ROM. Costs would be less if equipment were already owned. (* $6,000 - IBM PC-XT; $2,000 - CD-ROM player; $2,000 - annual subscription to AGRICOLA on CD-ROM)
- $20,000 to customize training disks for searching AGRICOLA on CD-ROM, including one non-English language audio channel
- $100,000 to develop each new video disk training program.

5. Recent technological developments that enable telefacsimile transmission of documents from microfiche should be investigated so that document storage and delivery may be optimized. However, the relative tradeoffs between microfiche storage and the use of electronic media (CD/ROM, optical digital disk, etc.) should be evaluated.

To be undertaken by the Liaison during Year 2. No estimated costs available at this time.

ACKNOWLEDGEMENT

KRI is grateful to the many individuals who took time to discuss their experiences and provide guidance for defining LDC and mission agricultural information problems. Annex A of this report is a list of the people interviewed as part of the present investigation. We hope that this report will help S&T/AGR to improve the existing systems and continue to work toward solutions to the long-term problems.

ACRONYMS AND DEFINITIONS

AGIES	Agricultural Information and Exchange System, supported by AID/S&T/AGR
AGRIS	FAO's International Information System for the Agricultural Sciences and Technology
BRS	Bibliographic Retrieval Services, Inc., a North American database vendor
CAB	Commonwealth Agricultural Bureaux, Farham Royal, Slough, England
CALS	Current Awareness Literature Service, located at the National Agricultural Library
CGIAR	Consultative Group on International Agricultural Research
CNRS	Centre National de la Recherche Scientifique, in France
DIALOG	Information retrieval service of the Lockheed Information Systems, Palo Alto, California, a North American database vendor
DIHF	AID's Document and Information Handling Facility in Bethesda, Maryland, operated under contract to AID/PPC/CDIE/DI
DIMDI	Deutsches Institute fuer Medizinische Dokumentation und Information, a West German database vendor
DIS	Development Information System, the collection of databases created and maintained by the DIHF
EMBRATER	Empresa Brasileira de Asistencia Tecnica e Extensao Rural, Technical Assistance Service for rural extension programs
ESA/IRS	European Space Agency Information Retrieval Service, an online vendor located in Rome, Italy
EURONET	European online information retrieval network
FAO	Food and Agricultural Organization of the United Nations
FEDLINK	Federal Library and Information Network
IAALD	International Association of Agricultural Librarians and Documentalists
IAEA	International Atomic Energy Agency, Vienna, Austria
IARC	International Agricultural Research Center

ILCA	International Livestock Center for Africa in Addis Ababa, Ethiopia
KRI	King Research, Inc
LDC	Lesser developed country
LRDC	Land Resources Development Center, in Great Britain
NAL	U.S. National Agricultural Library
NTIS	National Technical Information Service, U.S. Department of Commerce, Springfield, VA.
OCLC	Online Computer Library Center, Inc., a cooperative database of cataloging data operating throughout North America
OICD	USDA Office of International Cooperation and Development
ORBIT	On-Line Retrieval of Bibliographic Text, an information retrieval system used by SDC
PHDS	Postharvest Documentation Service at Kansas State University
PIPIC	Postharvest Institute for Perishables Information Center at the University of Idaho
PPC/CDIE/DI	AID Bureau for Program and Policy Coordination, Center for Development Information and Evaluation, Development Information Division
PUDOC	Center for Agricultural Publishing and Documentation, The Netherlands
SDC	System Development Corporation, an online vendor located in Santa Monica, CA
SDI	Selective dissemination of information
SRIM	Selected Research in Microfiche, an NTIS service
S&T/AGR	AID Bureau for Science and Technology, Office of Agriculture
TIS	Technical Inquiries Service of USDA/OICD, funded by AID/PPC/CDIE/DI
TYMNET	International telecommunications network
USDA	U.S. Department of Agriculture

SECTION 1

BACKGROUND: AGRICULTURAL INFORMATION NEEDS AND PROBLEMS

Developing solutions to the problems inherent in improving access to agricultural information in developing countries, and in creating effective, efficient and economically-feasible channels of dissemination of agricultural research among industrialized countries and LDCs, is of significant importance to the progress of agricultural development. In the United States and many other industrialized nations, access to bibliographic, statistical and full-text databases, extensive research library systems and resources, and rapid communication channels for contacting experts, enable agricultural researchers, policy-makers, extension workers, administrators, and others to obtain up-to-date information quickly and inexpensively. This is not the case in often isolated and poor developing countries. As access to high-quality information in a timely manner remains beyond the reach of many LDC scientists, and as agricultural information is accessed and disseminated more and more in electronic form and less through traditional printed indexes, abstracting journals, books, etc., the ability to make informed choices in agricultural development will continue to elude LDCs and increase their dependence on outside advisors. Added to this, when even AID's own advisors, project managers and contractors in the field experience difficulty in obtaining accurate, quick and appropriately-packaged agricultural information, a wasteful and frustrating situation can arise. There have been many extensive systems and services designed to meet the information needs of agriculturalists on local, institutional and worldwide levels, but much work remains to be done to coordinate existing services, improve access to them, and increase LDC capabilities to perform agricultural information work.

1.1 Characteristics of Agricultural Information

The problem of domination of information in electronic form by industrialized countries is not unique to the field of agriculture. But there are several aspects of agricultural information that set it somewhat apart from other disciplines and account for some of the difficulties of

creating adequate information systems for its dissemination. First, agricultural information is scattered across many disciplines. The broad scope of this field was delineated well by Adimorahl:

> Agricultural documentation and information work is often made difficult by the complexity of agriculture and the fact that there is no clearcut definition of agriculture as a single subject of its own. Besides the classical branches of agriculture such as soil biology, soil chemistry, soil physics, agronomy, horticulture, forestry, breeding and genetics, animal nutrition, plant pathology, agricultural economics, agricultural engineering, agrometeorology, soil fertility, veterinary science, food technology, fisheries, landscaping, recreation and environmental management, agriculture draws from such basic natural sciences [as] botany, zoology, chemistry, mathematics, physics, geology, meteorology, statistics and from economics.

The interdisciplinary nature of agriculture means that relevant information exists in many different databases and that an agricultural information worker must be knowledgeable of, and able to access, a wide variety of sources.

It is also apparent that some of the literature of agricultural research and extension and valuable agricultural data exist in less formal formats than in many other fields. The forms for dissemination of useful information are not limited to journals, books and conference proceedings, but frequently include pamphlets, reports, project documentation, training materials, patents and others. A further problem with agricultural information, related to this diversity of formats, is the need for appropriately packaged information. Practitioners rarely find scientific papers of direct use to them in their work. Agricultural information must exist on many levels, to serve many audiences: administrators, project managers, extension workers, researchers, policy-makers, and even farmers, who may or may not be literate.

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[1] Adimorah, E.N.O. "Agricultural Librarianship, Documentation and Information Science in Nigeria." International Library Review 9:413-428, 1977.

A final aspect of agricultural information that makes its control and dissemination a challenge is that it is completely international in nature. Research is being performed, data collected, and techniques developed and documented throughout the world, in many different languages. Researchers and practitioners in one part of the world very often have critical needs for knowledge generated elsewhere. Since even very small and poor countries have the potential to contribute to the body of agricultural information, the variety of languages in which information is available is usually wide.

1.2 The Developing Country Context

This investigation focuses primarily upon the agricultural information needs of scientists, project managers, advisors and decision makers working in developing countries. This includes AID mission staff, AID contractors in the field and LDC nationals. The needs of extension workers and farmers require careful local investigation and planning, and tend to vary greatly depending upon socioeconomic conditions, so they are not discussed here. This general discussion of needs is based on interviews with AID staff (in S&T/AGR and in geographic bureaus) and other individuals with knowledge of the LDC context, and contact with agricultural librarians and agriculturalists from developing countries.

Though local situations can vary tremendously, some generalizations can be made about the types of information needed to support agricultural development activities in LDCs. First, LDC and AID field staff need information on the complete cycle of agricultural production: inputs, production, harvesting, processing and marketing. Economic and cultural information is also important for appropriate decision making and relevant technological development. No single system or service that has been designed to provide only "agricultural" information can ever supply the full range of information, drawing on many disciplines, needed for working in this field.

Worldwide material is needed, especially for marketing: world markets exist only for certain commodities, so data on specific regions is often required. Very often, the research needed to solve a particular problem (for example, processing techniques for a certain plant product) is being carried out at one or two research centers in distant areas of the world. LDC researchers need to know what is already known, to avoid costly duplication of research. Redundancy (i.e., repeating experiments done elsewhere) can be appropriate if a researcher knows what has been done by other researchers and practitioners and intends to determine applicability of particular experiments to local conditions, but it is unfortunate if such repetition is caused by lack of knowledge of others' findings and advances.

LDC agriculturalists need both the most recent and older information. Often, older materials in developing countries either have never been available there or have been destroyed. Peripheral or "grey" literature (including extension and training materials) is frequently needed and rarely accessible, and translations are sometimes needed of foreign-language materials.

Services which announce current research activities in an individual's area of interest are necessary to field staff and LDC scientists for obtaining and maintaining awareness in their research and project areas. A "quick answer" system is needed for mission staff, who rarely can wait for weeks for information needed for project work. Increased speed and quality of communication is necessary between the expert requesting information and the intermediary searching databases on behalf of the requestor.

Compounding this complicated mixture of needs is the fact that many systems and services exist, nationally and internationally, which are designed to provide information on agriculture and its many related and sub-disciplines. Most agriculturalists know of some of these systems and services; none of those interviewed were aware of all of the services even currently available, and most affirmed the need for clearer and more coordinated information on available services.

The major information problems confronting agriculture specialists working in a developing country, therefore, are:

- Maintaining awareness of relevant information being generated elsewhere, in both developed and developing countries;
- Obtaining needed information at an appropriate level, language and quantity, quickly enough to be useful and avoid waste and duplication of effort; and
- Access to services and systems that provide the needed agricultural information and current-awareness services, and knowledge of what is available from such services.

The ability of local LDC or mission librarians and information specialists to serve the needs of their users is limited by their own set of problems:

- Identification of relevant materials for users in printed and/or automated abstracting and indexing services is difficult as a result of the often prohibitive expense of many journal subscriptions or direct online (locally or through telecommunications) or indirect (batch and/or by a host system intermediary) access to automated files. (Note that some of the major existing secondary information services in agriculture are described in the next section.) Bibliographic services are also severely handicapped when the requestor cannot interact with the searcher in locating and selecting relevant material.
- Document delivery, i.e., obtaining the full-text version of cited documents, is complicated by slow and expensive mail/pouch service, difficulty of purchasing commercially published or other priced materials, documents being available only in formats that are not directly usable (e.g. microfiche, when no reader is available), and inability to locate a supplier of a needed item.
- Organization of locally held monographic and serially published materials for retrieval is limited by inadequate training in cataloging and indexing techniques, and insufficient hardware, software, manpower and support to create local libraries and databases.
- Provision of reference and current-awareness services requires sufficient training in agricultural information sources, services and research techniques, and access to existing current-awareness services (when relevant) or the capacity to create a local service (which is dependent upon local resources and their organization). Current-awareness services originating in other locations are sometimes not well-attuned to local needs and dependent on slow and/or unreliable mail service for delivery of documents.

SECTION 2
OVERVIEW OF AVAILABLE SERVICES

The major services that currently exist to serve these agricultural information users and intermediaries, as well as some services specifically intended for AID users, are outlined below. This description is by no means intended to be exhaustive but to describe in a very broad and practical sense where most mission and LDC agriculturalists can obtain information services. Emphasis is placed upon U.S. government (particularly AID-related) services because they usually are (or should be) most directly accessible to mission staff.

It should also be noted that many effective local and regional agricultural information systems and documentation centers and networks exist in LDCs, particularly in Latin America and Asia. Very often their strength lies in their coverage of nonconventional literature. These local and regional services are not detailed because the purpose of this report is to make recommendations on how AID can improve agricultural development information services. An exhaustive compilation of worldwide agriculturally-related institutions, currently in the planning stages at the National Agricultural Library, will provide a more balanced and complete accounting of institutional information sources and services in agriculture.

2.1 Databases

Listed here are several of the major agricultural abstracting and indexing services (bibliographic databases) available in machine-readable form. Most of these also have a serially published paper counterpart. Also mentioned are some non-bibliographic databases containing primary information on agriculture.

2.1.1 AGRICOLA (1970-)

AGRICOLA (AGRICultural Online Access) is a bibliographic database consisting of citations of journal articles, monographs, theses/dissertations and technical reports relating to all aspects of agriculture. AGRICOLA is primarily an index to the document collection of the U.S. National Agricultural Library, one of the largest collections of agricultural literature in the world with over 1.8 million volumes. The database contains over 2 million bibliographic references and is growing at a rate of approximately 125,000 records per year.

AGRICOLA is international in scope, but coverage of U.S. agricultural literature is most complete. Abstracts are provided for some AGRICOLA subfiles but not for the majority of citations. Recent initiatives are focusing on more comprehensive coverage of agricultural extension publications in the U.S., with the eventual goal of exhaustive coverage of all U.S. agricultural publications. Also new is NAL's use of the indexing terminology developed by the Commonwealth Agricultural Bureaux (CAB) in Great Britain for indexing materials cited in AGRICOLA. It is expected that use of this controlled vocabulary will greatly improve retrieval from the AGRICOLA database, and aid in cooperative efforts with the CAB and other database producers.

AGRICOLA is directly accessible through several major U.S. and European database brokers (DIALOG, BRS and DIMDI, with the Library's cataloging records on OCLC) and on magnetic tape. NAL is currently experimenting with compact disk technology as an alternative means of providing direct access to AGRICOLA.

2.1.2 AGRIS (1975-)

AGRIS is a bibliograhic database of international agricultural literature, sponsored by FAO, that corresponds to the published AGRINDEX of the International Information System for Agricultural Sciences (AGRIS). The database is a cooperative effort of agricultural information centers and libraries around the world which locate and index relevant materials in their countries or regions. AGRIS membership currently includes more than

116 countries and 14 multinational organizations. Records are merged by the AGRIS Coordinating Centre in Rome and put on magnetic tape which is then used to produce AGRINDEX. Copies of the monthly tapes are made available to cooperating organizations who have adequate computer installations to use the database for local searching and production of printed products. The Centre for Agricultural Publishing and Documentation (PUDOC) in The Netherlands and EMBRATER (Empresa Brasileira de Asistencia Tecnica e Extensao Rural) in Brazil are among the groups that have used AGRIS tapes for such services. The entire AGRIS database is held online on computers at the IAEA in Vienna and DIMDI in Cologne. It may be accessed via ESA/IRS as well as via EURONET and TYMNET. AGRIS is expected to be made available through DIALOG this fall, which will provide direct access to users in the U.S., Europe and some developing countries.

No abstracts are prepared for AGRIS records. The database's coverage of the nonconventional literature from developing countries is considered one of its major strengths, along with its broad international scope. A weakness inherent in such an international system is the necessarily limited quality control of entries and the existence of duplicate records within the database. Approximately 40% of the AGRIS database is U.S. input in the form of the AGRICOLA database.

2.1.3 CAB ABSTRACTS (1973-)

The Commonwealth Agricultural Bureaux's database of approximately 1.7 million references, most with abstracts, offers broad and selective international coverage of the literature of agriculture and areas of applied biology. The file represents the contents of CAB's abstracting journals (each comprising a subfile of the database, searchable separately if desired). There are presently some 58 CAB journals, covering specific aspects of animal science and production, veterinary science and parasitic diseases, crop science and production, forestry, crop protection, economics, development and sociology, machinery and buildings, food and nutrition, biotechnology, taxonomy and agriculture in general.

CAB is an international non-profit organization controlled by governments of the British Commonwealth of Nations, but its products are produced on a cost-recovery basis. CAB Abstracts database is available online via three major online hosts: DIALOG, ESA/IRS and DIMDI; like AGRICOLA and AGRIS, magnetic tapes are also available. The database is expected to continue to grow at a rate of 150,000 records per year.

The high-quality abstracts that accompany CAB references significantly enhance the value of the database, especially for foreign-language materials. Past problems of duplication when searching the entire database, caused by the same item being abstracted by several different CAB journals, have been minimized. The CAB's policies of selectivity have caused them to bypass much of the nonconventional literature that is covered in AGRIS, and, to some extent, in AGRICOLA.

These three databases and their products and services have become known as the "big three" agricultural databases, primarily because of their size, international coverage and multidisciplinary scope. Each has great strengths and important weaknesses, and very few research sites in the world have direct online access to all three. A recent comparison of the three databases' coverage of the publications of the 13 CGIAR agricultural research centers (Table 1) illustrates differences in coverage and handling of some developing country materials. Reflected in these figures, for example, is the fact that AGRICOLA catalogs many serially published items (such as the CGIAR Centres' series) as whole series, and does not separately index each report. These figures probably also indicate problems of duplicate entries in AGRIS and CAB. While most of the differences are due to the database producers' varying objectives, funding and organization, closer cooperation between the three is possible and would greatly benefit all their users. Significant strides were made toward such cooperation within the past year (with, for example, NAL's adoption of CAB's vocabulary), and a strong affirmation of the goal of cooperation was stated by representatives of NAL, CAB and FAO at the June 1985 conference of the International Association of Agricultural Librarians and Documentalists (IAALD) in Ottawa. IAALD's president, Ernest Mann, proposed a scheme for cooperation among the three database services initially, possibly to include other agriculture databases in the future, that divides the world's

TABLE 1

COMPARISON OF THE COVERAGE OF CGIAR CENTER PUBLICATIONS IN MAJOR INDEXING SERVICES

CGIAR Center	AGRICOLA (1970-4/85)	CAB Abstracts (1972-4/85)	AGRIS (1975-5/85)
CIAT	60	196	465
CIMMYT	34	179	139
CIP	29	86	433
IBPGR	6	34	85
ICARDA	6	45	10
ICRISAT	77	173	10
IFPRI	59	24	82
IITA	40	109	20
ILCA	9	73	96
ILRAD	5	8	3
IRRI	140	362	1546
ISNAR	1	10	2
WARDA	14	14	7

SOURCE: Secretariat, Consultative Group on International Agricultural Research.

agricultural literature among the three, provides for coverage of non-conventional as well as conventional materials, calls for a single common indexing language and identical indexing rules, and an advisory panel to develop guidelines for selection and abstracting of certain materials.[2] Such an initiative, if enacted, would improve access to relevant information by filling gaps, eliminating unnecessary overlap and, probably, reducing the cost involved in comprehensive literature searching.

2.1.4 Other Commercial Databases

There are, of course, many other relevant bibliographic databases specializing in the various sub-disciplines of agricultural research. A comprehensive listing of databases of agricultural interest, Agricultural Databases Directory (compiled by Martha Williams and Carolyn G. Robins), will be published in fall of 1985 under a cooperative agreement between the National Agricultural Library and the University of Illinois. This listing will fill an important need for information on the rapidly-increasing number of relevant agricultural databases and will include numeric as well as bibliographic databases. The brief list of databases below is intended for representational purposes only, to illustrate the variety of specialized databases that complement and supplement AGRICOLA, CAB and AGRIS by in-depth coverage of specific subject areas in agriculture.

- Food Science and Technology Abstracts, produced by the International Food Information Service (IFIS) in Great Britain, is a leading information source for research and development literature in all areas of food science and processing.

- TROPAG, the machine-readable version of Abstracts on Tropical Agriculture, produced by the Royal Tropical Institute in Amsterdam, provides extremely important coverage in the area of tropical agriculture that is not available elsewhere. Containing over 50,000 citations, it is an important tool for developing countries with tropical climates, and is available through the SDC-ORBIT system. A particular strength of this database is its emphasis on coverage of "grey" literature.

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[2] Mann, E.J. "Past, Present and Future Developments in Agricultural Information Transfer." Address to the 7th IAALD World Conference, June 2-6, 1985, Ottawa, Canada.

- Aquatic Sciences and Fisheries Abstracts, produced by FAO and the Intergovernmetal Oceanographic Commission of UNESCO, is a broad-based source of information on life sciences and legal, political and social issues related to marine environments.

- Water Resources Abstracts provides summaries of research reports and articles on water planning and quality.

- Aquaculture is an index to a wealth of sources in all aspects of aquaculture.

- Zoological Record is a source of systematic/taxonomic information with worldwide coverage of literature in virtually every area of zoology.

- Biosis Previews extensively provides worldwide coverage of research in the life sciences. It is the major English-language source of biological information from over 9000 journals and other varied publications.

- NTIS provides citations and abstracts for government-sponsored research, development and engineering plus analyses prepared by federal agencies, their contractors or grantees.

This is only a sampling of the databases relevant to agricultural development. Major national and international efforts exist in France, Germany and many other industrialized and developing nations. Many of these are available on the European online networks, such as DIMDI and ESA/IRS. Frequently, however, access outside of the country or region is limited to those able to mount magnetic tapes on a local mainframe or minicomputer (rare in developing countries). Even those databases available through networks are limited to sites that are able to establish telecommunications with the host computer. While some sites in Latin America, Asia and the Near East are able to obtain access, most of Africa is currently unable to do so.

2.1.5 Development Information System

One other database that must be mentioned as a source of information for agricultural development is AID's own Development Information System. It is a combined bibliographic and informational database containing citations (with some abstracts) of AID-funded technical and policy reports and summary information on AID projects. The minicomputer-based system is currently accessible through search intermediaries in PPC/CDIE/DI

though the Development Information Division is currently exploring development of microcomputer-based subsets of the database, and has expressed some interest in investigating compact disk storage. While the bibliographic database is largely duplicated by AGRICOLA and NTIS, it does contain some unique AID-generated items, and the project database provides data on AID's project experience that does not exist elsewhere.

2.1.6 Non-Bibliographic Databases

There are many non-bibliographic databases of worldwide interest to agriculturalists. Many of these are large statistical files available only on magnetic tape (for example, FAO's production and trade statistics and USDA's various files, which are often used in their printed formats). Of these, only two are mentioned here because of their wide availability and interest to agricultural development officers.

CRIS (Current Research Information System) contains research activity reports of USDA, state agricultural experiment stations, and other cooperating institutions. Over 27,000 research descriptions contain identification data (investigators, performing organization, etc.), project title, objectives, approach, progress, publications, expenditures, and manpower data. FAO has a similar system of documenting current agricultural research internationally called CARIS. CRIS is available on DIALOG.

AGNET, produced by the Foreign Agricultural Service, contains current data on world agricultural production and trade. The purpose of this database is to support FAS's mission of expanding foreign markets for U.S. farm commodities, but some of the information it holds would also be valuable to decision makers in developing countries. Access is provided to the file on a USDA computer through dial up communications.

2.2 Collections and Document Delivery Services

Major collections of agricultural publications are of interest to LDC scientists and librarians because they can be a resource from which to obtain copies of needed reports, journal articles, etc. This discussion focuses upon some accessible collections and document delivery services that can or should be exploited by AID staff.

2.2.1 U.S. National Agricultural Library (NAL), AGIES and USDA Technical Inquiries Service

The breadth of NAL's holdings was mentioned in the earlier description of AGRICOLA. Annex C is a detailed description of the holdings and selection policies of NAL. Access to NAL's holdings, either by borrowing books or receiving photocopies of articles, is limited (to non-USDA staff) to the formal system of interlibrary loan; items can be requested for a user by another library only. The AID Library can request materials for AID staff by this means, identifying items to be borrowed in AGRICOLA or OCLC.

There are two other programs, funded by AID, that draw upon NAL's resources to provide document delivery services to field staff and LDC researchers. The AGIES project (Agricultural Information and Exchange System), which is described in more detail in Section 2.3.1, provides approximately 10,000 photocopied documents per year to developing countries. Approximately half of the documents are requested by AID missions and the other half directly from LDC scientists. The AID pouch system is used whenever possible to send documents to requestors. The other document delivery resource that can be utilized by field staff is the USDA Office of International Cooperation and Development's Technical Inquiries Service (TIS), funded by AID/PPC/CDIE/DI. The TIS (which is also described in more detail in Section 2.4.1) will provide documents to mission staff from NAL and other sources in response to information requests. The TIS focuses its services in response specifically on AID mission staff and AID contractors in the field, and is heavily used by them as an information resource.

A new agreement between NAL and OICD has broadened an existing OICD program of overseas translation of foreign-language materials using Special Foreign Currencies (SFC) as authorized under Public Law 480. These services have now been extended to AID staff, in Washington and in the USAIDs. Details of the program and AID's access to it are given in Annex D.

2.2.2 AID's Development Information Division (PPC/CDIE/DI)

PPC/CDIE/DI maintains the AID Library and operates a clearinghouse of AID-sponsored publications, the Document and Information Handling Facility (DIHF) in Bethesda, MD. The DIHF will supply documents on demand in microfiche or hard copy and the store of documents approximately corresponds to the items cited in AID's database, the Development Information System (DIS). Documents and fiche are supplied free of charge to AID staff and are available to other requestors at a cost of $1.08 per fiche or $0.13 per page for paper copies.

Documents in CDIE/DI's database and clearinghouse can be identified by their announcement in ARDA (AID Research and Development Abstracts), which is published quarterly (though is sometimes irregular) and distributed to approximately 7,000 individuals and institutions, mostly in developing countries. ARDA, however, represents only a selective subset of the items in DIS; to identify a document from the complete database, a request must be made to CDIE/DI. The Division is contemplating broad distribution of an accessions listing of all items added to the database.

In addition to items cited in the DIS database, the AID Library has a unique retrospective collection of development-related materials, many focusing on the agriculture sector. Records of these holdings have not been automated, nor has a list of holdings been compiled, so requests for materials must currently be forwarded to the AID Library for a manual search of their card catalog.

2.2.3 Specialized AID-Funded Centers

AID has established many information centers and clearinghouses, specializing in areas of agricultural research that are of particular interest in the development context, at universities throughout the United States. A complete current list of these centers has not been compiled, but an older listing (1980) appears in Section 3.1.4 of this report. Two examples of these centers, whose staffs were interviewed for this report, are the University of Idaho's Postharvest Institute for Perishables Information Center (PIPIC) and the Postharvest Documentation Service (PHDS)

at Kansas State University. Each of these centers collects materials in their subject area, catalogs them, regularly announces them (in accessions lists) and provides document delivery services for all items they announce. These services are provided free of charge to their primary users, individuals and institutions in developing countries. Their documents are available in both microfiche and paper copy.

In addition to the special information centers at U.S. universities that have been funded by AID, the 13 centers of the CGIAR system are sources of the documents that they produce (which, as noted above, are cited in AGRICOLA, CAB and AGRIS). Many of the centers publish accessions lists and some centers have undertaken major programs to improve document delivery and bibliographic control in their subject area. One example of this is the extensive microfiching project that has been carried out in 22 African countries to date by the International Livestock Centre for Africa (ILCA) in Addis Ababa, Ethiopia. Complete sets of microfiche accompanied by printed catalogs have been donated to the countries involved and have provided the countries with an organized means of accessing the literature on livestock development that they have produced. The CGIAR Secretariat at the World Bank is coordinating an effort to catalog and microfiche all Centre publications in a major retrospective and ongoing effort. The outcome of this project would be complete sets of Centre publications on microfiche, accessible by a catalog providing author, title and subject access, that would constitute a ready-made "library" to developing country research sites.

2.2.4 National Technical Information Service (NTIS)

The NTIS database and clearinghouse, focusing on coverage of technical reports prepared or sponsored by U.S. government agencies, is a well-known document source in many developing countries. While only about 5 percent of the NTIS database is estimated to cover materials dealing with the various aspects of agriculture, items cited therein can be obtained from NTIS. NTIS has a strong and well-organized international network of outlets and distributors, making them particularly accessible to developing countries. However, their prices are often too high for LDC budgets.

Also, their coverage is limited to government reports and the database is often critized for not being current.

2.2.5 The Genuine Article

The Genuine Article is a document delivery service of another commercial organization, the Institute for Scientific Information (ISI) in Philadelphia, PA. This service provides copies of all articles cited in ISI's bulletin, Current Contents. Many scientists regularly scan Current Contents issues covering Agriculture, Biology and Sciences and their Life Sciences edition, or identify articles through ISI's online databases available on DIALOG and SDC.

2.2.6 UMI Article Clearinghouse

The Article Clearinghouse of University Microfilms International (UMI) is a relatively new commercial document delivery service. UMI's current coverage is not strong in the agricultural sciences but it is expected to grow and respond to identified demand. UMI's Article Clearinghouse service has just been made available to Federal Government subscribers at a reduced rate through FEDLINK. Journals covered by the service are listed in a catalog that is publicly available.

2.2.7 Commonwealth Agricultural Bureaux (CAB)

CAB offers a photocopy service for delivery of most journal articles cited in its abstracting journals (and online database). Items must be paid for in pounds sterling, and deposit accounts are available. There is a minimum charge of 3.00 pounds per item, at 0.30 pounds per page inclusive of delivery, which is by air outside the U.K. Items can also be ordered through Lockheed's DialOrder or ESA's Primordial (online ordering) services. Like NAL, CAB can only supply photocopies of those items for which copyright permission can be obtained, meaning that complete books cannot be procured from them.

2.2.8 British Library Lending Division (BLLD)

The British Library has long been a major source of photocopied items for European and some developing countries. Their extensive holdings and lending services are utilized by libraries throughout the world. Over three million documents in microform are included in the British Library's resources, and materials are photocopied or supplied in microform (both at a cost) to requestors.

2.2.9 AGLINET (Worldwide Network of Agricultural Libraries)

To complement FAO's AGRIS system, the AGLINET library network has been established to provide document delivery services for items cited in AGRIS/AGRINDEX. Individuals are encouraged to try local and national libraries before requesting copies from AGLINET libraries. The network is comprised of two African libaries, three Asian, eight European, one North American (NAL), four South American libraries, plus FAO in Rome as an international center.

These are some of the sources that libraries and individuals in developing countries use to obtain needed documents. Strengthening local library collections with relevant and frequently-needed materials remains an important and desirable activity in developing countries, and international document delivery services should be considered one source of supplementing and supplying items for those collections. A growing method of circumventing the very high cost of journal subscriptions in developing country documentation centers is the practice of requesting reprints of articles directly from their authors. This method of obtaining current articles is practical only when there is a means of identfying new articles of interest and if the turnaround time is acceptable. When this method is used by a library, it should be supplemented by the purchase of back runs of core journals in microform, when feasible, to improve the quality of the collection.

2.3 Current Awareness Services

Current awareness services, sometimes referred to as SDI (Selective Dissemination of Information), are methods of notifying individuals of new information in their area(s) of interest. Formal and informal methods of staying current in professional information generally take three forms. The most traditional form is the practice of regularly scanning professional journals, publication announcements, newsletters and abstracting journals. This is done either by the user himself or by an information center in the user's institution which then brings items of interest to the attention of the user. A logical extension of this activity is the circulation of contents pages of current journals within an institution by the library or from commercial sources. A third means of providing current awareness services has evolved from the rapid growth of relevant information that must be covered by professionals and the existence of automated means of capturing that information. SDI services based on automated databases entail creation of a profile of a patron's ongoing interests, establishing appropriate searching methodology that will extract items from the database that fall within the profile, running the search against new records added to the database on a regular basis, and forwarding the search results to the patron. This provides him with the equivalent of an indexing and/or abstracting service in his field of interest, but with SDI the area of interest can usually be very specifically defined and altered as projects and priorities change.

2.3.1 AGIES

A primary focus of the current investigation has been the SDI services provided to AID agricultural staff and LDC agricultural scientists through the AID-funded AGIES project. AGIES' AID-UPDATE program is an SDI service based primarily (95%) on NAL's AGRICOLA database. There are approximately 1,000 subscribers to AID-UPDATE, with about half being AID staff (in AID/Washington and the missions) and half LDC nationals. Developed as a pilot project, AID-UPDATE is intended to extend the same service to developing countries that has been provided to over 3,000 USDA agricultural scientists through NAL's CALS (Current Awareness Literature

Service) program. As mentioned earlier, AGIES SDI searches are complemented by a document delivery service that is also part of the AGIES project. In many cases, AID-UPDATE is the only technical current awareness mechanism available to AID staff in overseas posts.

2.3.2 NTIS Selected Research in Microfiche (SRIM)

Another service, designed primarily for libraries and documentation centers, who provide SDI services to their institutions and whose budget enables them to afford it, is the SRIM (Selected Research in Microfiche) program of the National Technical Information Service (NTIS). Based upon SDI profiles for searching the NTIS database, SRIM provides the full text of reports matching the profile on microfiche every other week, and also provides a quarterly index (with annual cumulations) to accompany the items the user receives. The current cost of this service is $1.10 per fiche, with an added charge for the index, but the prices are expected to rise later in the year. While there are obvious advantages to an SDI service that supplies the full text of a cited document, the NTIS database's coverage of relevant agricultural topics is somewhat limited.

2.3.3 Abstracts on Tropical Agriculture

The Royal Tropical Institute in Amsterdam, publisher of Abstracts On Tropical Agriculture, offers an SDI service based on the journal's online version, TROPAG. Computer selected abstracts are sent to profiled users monthly on cards. The abstracts are sent by air mail to subscribers, and costs vary depending upon the number of cards sent, with a minimum of 50.00 Dfl. per year.

2.3.4 Current Contents

The Institute for Scientific Information (ISI) produces one of the best-known contents-page alerting systems, Current Contents. The two Current Contents journals of most interest to agricultural scientists are the Agriculture, Biology and Environmental Sciences and Life Sciences editions. These journals reproduce the contents pages of a number

of "core" journals in their respective disciplines. The journals selected tend to be highly scientific in nature and usually not targeted to practical, appropriate applications for development projects.

2.3.5 Other Abstracting/Indexing Services

A large number of abstracting and indexing journals are used by agricultural scientists to maintain awareness of activities in their fields. The Commonwealth Agricultural Bureaux abstracting journals are well-known examples. Some specialists rely upon accessions lists and bibliographies produced by centers such as Great Britain's Land Resources Development Center (LRDC), France's Centre National de la Recherche Scientifique (CNRS), and AID-funded information centers. Those abstracting and indexing services that are provided free of charge or as part of membership in a professional society, of course, are the ones that are mostly used in LDC's. Expensive subscriptions that must be paid in foreign currency (or that, like SRIM, require a deposit account) are often beyond the means of a developing country with foreign exchange and/or bureaucractic problems.

2.4 Reference and Information Services

Reference services refer to very labor-intensive and in-depth information services in which a request for information is analyzed and discussed with the requestor and the requested information is gathered and packaged for the user from whatever sources are appropriate. Such services generally draw upon the types of resources described earlier (i.e., databases and library collections) as well as advice from subject experts, and can be relied upon for information ranging from "quick" facts to support through the various stages of a lengthy research or operational project.

2.4.1 AID-USDA Technical Inquiries Service (TIS)

An important Washington-based resource for information services to AID agriculturalists is the Technical Inquiries Service (TIS) in USDA's Office of International Cooperation and Development, funded by AID/PPC/CDIE/DI. Known by many as the "Pat Wetmore service," its growth and support in the field is strong evidence of the common need for reference services, particularly by mission staff who do not have easy access to other information sources. The objective of the TIS is "to identify, select and provide USAID on request technical and extension materials that are needed in the design and implementaton of agricultural programs overseas."[3] These services are generally limited to AID staff and AID contractors, primarily those located in the field, and LDC users can only be served by having a mission staff member request on their behalf. The TIS specializes in providing information when it is needed, and is a very useful complement to the AGIES SDI and document delivery services.

2.4.2 AID-Funded Centers and AID/PEST

Most of the AID-funded centers operate as clearinghouses in their particular subject areas. Their proximity to experts in their specialties allow them to draw on that expertise to provide information to their users. Many provide some document delivery and current awareness services, but their particular strength is their subject expertise.

AID/PEST, a third activity carried out under the AGIES project, is a specialized service designed to provide information on selected pesticides to AID staff only. The database is intended to meet a specific information requirement of AID's agricultural program and is an example of the type of specialized reference service that can be developed through cooperative collaborations between NAL and AID. AID/PEST is not yet active and therefore has not yet been promoted to field staff.

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[3] USDA Office of International Cooperation and Development. Report for Fiscal Year 1981 - RSA No. 3-74, Agricultural Information and Related Services, U.S. Department of Agriculture. Submitted to the Agency for International Development.

2.4.3 AID Mission Libraries

Some AID missions have their own librarians or information specialists who perform this "information brokering" function with the important advantage of direct staff contact. There are very few such missions, however. It is hoped that the increased future availability of training for agricultural information services from NAL might be exploited by mission directors in staff development planning for information support to USAIDs.

SECTION 3

RECOMMENDATIONS TO S&T/AGR

This section contains recommendations to S&T/AGR on various ways to encourage improvement in the accessibility and quality of information services available to mission and LDC agricultural specialists. The recommendations relate to:

- the improvement, consolidation and/or promotion of existing AID-related services;
- creation of new services and centers in the near- and long-term;
- technological developments that would benefit LDCs, now and in the long-term; and,
- training and user education.

A basic assumption driving these recommendations and a point to be emphasized to S&T/AGR, is that information services, particularly in non-commercial or industrial fields, tend to have very limited funding resources. Naturally, an institution such as the National Agricultural Library, funded by the U.S. Congress to serve the U.S. Department of Agriculture and U.S. agriculturalists, responds primarily with information products designed for that constituency. This is well illustrated by their choice of the Pork Industry Handbook for a full-text videodisk online retrieval experiment. AID must promote and encourage an awareness at USDA and other U.S. government agencies of the needs of developing countries. Unless AID provides financial resources for support of projects that benefit AID mission staff and LDCs, their needs will not be considered. The resulting lost opportunities, particularly related to current technological developments at NAL, would be immeasureable and difficult to reverse.

3.1 Existing Services

3.1.1 AGIES

The AGIES service, because it is funded by S&T/AGR, was a primary focus of this study. After reviewing evaluations of the AGIES Project, interviewing the AGIES contractor, project manager and some users of the service[4], KRI recommends that the following steps be taken by S&T/AGR and AGIES Project staff:

- Provisions should be made to achieve a closer integration of AGIES Project services with the planning process and current services of NAL. Particular areas and products requiring more coordination include: working with NAL's reference staff to exploit particular strengths of subject expertise and coordinate the production of "Quick Bibliographies" with AGIES retrospective and current-awareness computer searches; attendance at NAL collection development meetings by the AGIES Project manager and providing suggestions for new vocabulary, new lending services, etc., as identified in the course of providing AGIES services; and cooperating with NAL's Lending Division to streamline photocopy and document delivery procedures.

- AGIES should begin using electronic mail communications where possible to and from field missions, to speed communication of requests and SDI profile development. NAL, S&T/AGR and the AGIES contractor should also examine the use of new telefacsimile technology for speeding the document delivery process to AID missions. Further, funding of the AGIES Project should include an allowance for long-distance telephoning to missions, to be instituted as a pilot project; at the end of the test period NAL should make recommendations to S&T/AGR concerning the cost-effectiveness of this method of communicating with field staff.

- AGIES staff should continue to investigate means of improving communications with their users, focusing on periodic checking and follow-up to determine whether searches are still useful and relevant. A user feedback form should be developed. NAL should cooperate with S&T/AGR and AGIES staff to improve and increase marketing and promotional activities associated with AGIES. The level of travel funding necessary to further this end should be provided to the AGIES project. Especially effective forums for AGIES promotion are AID's biennial agricultural development officers' conference and regional agricultural meetings.

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[4] See Annex A for a list of individuals interviewed for this study.

- S&T/AGR, NAL and AGIES should establish clear guidelines as to the scope and definition of services provided under the AGIES project. It is recommended that AGIES concentrate on document delivery, current awareness searches and developing accurate user profiles with initial retrospective database searches. The usefulness to field staff of increasing the use of other agricultural and biological databases should be investigated. The objective is to promote a service to AID field staff that is clearly understood and delineated from other information services available to them.

These recommendations for AGIES are consistent with the findings of evaluation panels reviewing the project in 1982 and 1984. Those investigations reaffirmed the need for AGIES current awareness services and recommended improvements in management of the service. KRI's interviews with AID agriculturalist staff revealed that some were not familiar with the service, and others indicated that, while they found AGIES valuable, it was not entirely clear to them what AGIES services were and how they differed from other services, particularly the OICD Technical Inquiries Service. Interviewers also indicated that there was insufficient promotion of AGIES and not enough responsiveness to subscribers' changing needs. Specifically, users did not appear to know how to have their profile changed or services transferred or ended when they moved on to a new assignment or a project was completed.

In order to develop a clear, concise statement of AGIES services, as part of the marketing activities that are necesary, S&T/AGR and AGIES staff must define what their services are and how they complement existing services. KRI recommends that AGIES concentrate on its current awareness (SDI) search and document delivery services. These services should be clearly described in promotional literature that should be sent regularly to field missions. It is estimated that 60-70 percent of document requests that AGIES receives are based on citations from the current awareness searches. This indicates that LDC scientists rely upon AGIES as a document delivery service. Document delivery through AGIES should be publicized and emphasized in AGIES service priorities, and rapid turnaround time should be considered an important performance indicator.

Communication and cooperation between NAL's public services staff, AGIES and the OICD Technical Inquiries Service also need to be strengthened. Each should help promote the others' complementary services along with their own to eliminate the confusion which currently exists on the part of users. This might be more easily accomplished if the following delineation of the services were adopted:

- AGIES is a current awareness literature search service for AID and developing country clients. As such, it extends to LDC scientists the type of SDI services available to USDA scientists through NAL. AGIES also extends to LDCs the document delivery services available to U.S. scientists through NAL's lending services by providing a photocopy document delivery service. To perform current awareness and document delivery effectively, AGIES must perform retrospective database searches and establish the most rapid and effective communication and document transmission methods feasible.

- OICD/TIS is a reference and information service for AID agricultural development officers in the field only. It provides answers to questions for agricultural information from field staff. TIS provides basic reference services to a very specific target audience and, because of the strong user communications inherent in such a service, TIS should be a primary vehicle for promoting AGIES services.

- NAL's lending branch and reference staff provide document delivery and information services to U.S. clients. NAL should support AGIES document delivery services when possible and patron referrals should be made back and forth between NAL reference and AGIES staff whenever the patron could benefit by access to specific expertise.

3.1.2 AGRICOLA

Much of the cooperation with other international databases that is needed to make AGRICOLA a more relevant product to support international development projects has begun in the past year. Because of recent cooperative efforts, NAL will be concentrating more upon exhaustive indexing of U.S. publications, particularly USDA and state experimental station and extension service imprints. Current selection and indexing priorities of AGRICOLA are listed in Annex C. AGRICOLA's specialization in total coverage of well-defined subject and geographic areas will improve the quality of the database. Quality will also improve with the use of a

controlled vocabulary, CABVOC, developed (and used) by the Commonwealth Agricultural Bureaux. NAL should be encouraged to continue to work closely with FAO and CAB for complementary and high-quality databases.

Lack of access to AGRICOLA continues to be a problem for developing countries. Though NAL has made its database available as broadly as possible through the major database suppliers of North America and Europe, most developing countries do not have direct access. It is for that reason that AID/S&T/AGR should strongly support the provision of AGRICOLA access on laser disks with high storage capacities. If the database must be subdivided for disk storage, it would be more advantageous to LDC searchers to have access to the complete database for set numbers of years, rather than entire chronological parts of AGRICOLA divided by subject area. This is because any developing country site that might have a laser disk installation is almost certain to be supporting a large number of users with varying needs, and would therefore profit from the broadest subject coverage possible. Thus, the developing country "markets" for AGRICOLA disks may not be segmented in the same way as those in the U.S. who have access to AGRICOLA and other databases through many available mechanisms.

It is widely perceived that AGRICOLA's coverage of nonconventional literature is not as comprehensive as it might be. While this may be changing with new selection and indexing guidelines, it has been suggested that NAL coordinate more closely with AID to capture more AID-funded or acquired "grey" literature. Some of those reports are collected, indexed and microfiched by AID's Document and Information Handling Facility (DIHF), and NAL now receives any new microfiche produced by DIHF. Acquisition and collection of AID's fiche will improve NAL's (and AGIES') document delivery for AID-funded items, but not AGRICOLA's coverage of them. However, since the DIHF's coverage of AID-funded agricultural materials is incomplete, and since AID's database does not use standard MARC format or the same indexing language as AGRICOLA, a simple merging of data files is not currently feasible. S&T/AGR should establish a request mechanism within AID to obtain donations to AGRICOLA, both from retiring staff (AID-wide) and on a regular basis from active AID agriculturalists. AID's personnel office (M/PM/OD) has agreed to allow a letter to go out to retirees as part of their standard package for retiring staff members. A different letter,

targeted for agriculturalists only, should be sent semiannually. Included in these letters should be information on tax deductions for personal items that are donated to NAL. Requested donations could be sent directly to NAL's Exchange and Gifts Division, where it will be checked for fugitive (nonconventional) literature to be added to AGRICOLA. Also, selection officers of NAL and the DIHF should continue to coordinate their activities and policies for better coverage of AID materials.

As part of NAL's responsibility for covering U.S. research, a determination should be made of AGRICOLA's coverage of relevant materials from international organizations located in the U.S. (such as the World Bank, the Inter-American Development Bank, United Nations, etc.). These organizations produce many informal, non-proprietary research and policy reports that are not distributed by their publications departments. It is often necessary to be on mailing lists at the departmental level to receive these materials.

NAL is currently negotiating an agreement with the 13 international agricultural research centers of the Consultative Group on International Agricultural Research (CGIAR), whereby NAL would become the AGRIS input source for all CGIAR documents. CGIAR reports would be forwarded to AGRICOLA, indexed, and then retained at NAL. Such an arrangement will greatly improve access to CGIAR publications in the U.S. and, if AGRICOLA is made available on laser disk, in developing countries as well. AID should investigate the bibliographic records created for items NAL receives from CGIAR centers, because they are mostly published serially and may not be indexed individually on AGRICOLA. NAL does, however, expect to provide more individual treatment of monograhic series than it has in the past.

Acquisition of other developing country materials is mostly passive at NAL. Items are received through exchange agreements with institutions, an arrangement which does not usually result in exhaustive coverage of an institution's publications. Records of NAL's extensive exchange program are not automated and it was not possible as part of this investigation to measure the extent of coverage. NAL's management has expressed its desire to improve coverage of the literature that is not included in other databases (especially CAB and AGRIS), but no effort to improve acquisitions

of items already in CAB and AGRIS is expected. NAL does expect to automate its exchange file, which should provide data needed for measuring the program's effectiveness and making more active acquisitions efforts where needed.

A final concern stated by AID staff regarding AGRICOLA's coverage dealt with research and information generated by the private sector. While information sharing with private corporations is often made difficult because it can be costly and/or proprietary, it should be noted that demand exists for private sector information, and that use of the resources of the private sector is an important AID policy objective. It would be useful for NAL to study the cost of acquiring reports from U.S. agribusiness and private research facilities, and to report funding levels that would be needed if acquisitions are to be expanded.

3.1.3 NTIS

The National Technical Information Service (NTIS) also coordinates with AID's DIHF and attempts to cover AID research reports. It is estimated that the NTIS database's coverage of agriculturally-related materials is only about 5 percent (approximately 45,000 citations), and many of its materials are old. NTIS receives materials from USDA, AID, Department of Interior, National Academy of Sciences, and other U.S. government sources of agricultural information. Strengthened cooperation between PPC/CDIE/DI and NTIS should be encouraged. It is not currently feasible to suggest, however, that NAL rely upon NTIS to cover USDA publications, since NTIS does not focus primarily upon agriculture and does not use agriculture-specific vocabularies, compatible formats, etc. The importance of NTIS to S&T/AGR lies more in its document delivery capabilities in developing countries. NTIS microfiches all of the materials cited in its database, and has an extensive marketing and distribution network throughout the world. NTIS's costs are rising, however, and special prices for developing country clients are being phased out.5

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5 U.S. National Technical Information Service. NTIS Implementation Plan, AID/NTIS Project. AID internal document, June, 1983.

NTIS's international distribution channels and capabilities could be considered for distribution of the AGRICOLA database on laser disk. NTIS already sells AGRICOLA magnetic tapes and bibliographic databases, software and data files from USDA and other agencies on laser disks and floppy diskettes. NTIS also sells the AGRIS database on magnetic tape.

3.1.4 AID-Funded Agricultural Information Centers, Clearinghouses and Databases

For this study, interviews were conducted with only two of the information centers funded by AID: the Postharvest Institute for Perishables Information Center (PIPIC) at the University of Idaho and the Postharvest Documentation Service (PHDS) at Kansas State University. A complete current list of all the centers was not available, but an NAL compilation in 1980 listed the following centers based at U.S. universities:

Location of Information Centers	Subject Specialty
University of Arizona; Colorado State University; Oregon State University; U. of California at Riverside; Utah State University	Small Watersheds; Engineering On-Farm and Off; Moisture Utilized in Semi-Arid Tropics; Irrigation; and On-Farm Water Management
Cornell University	Tropical Soils
Kansas State University	Post Harvest Food Losses
Michigan State University	Energy and Agriculture
University of Arizona	Arid Lands
Univeristy of Florida	Livestock
University of Hawaii	Nitrogen Fixation - Tropical Legumes, Tropical Soils
University of Idaho	Postharvest Food Losses
University of Illinois	Crop Production - Soybean
Utah State University	Livestock

Clearinghouses	Subject Specialty
Mississippi State University	Information service on Seed Program and Seed Industry
University of Rhode Island	College of Fisheries - development literature and information
University Wisconsin Land Tenure Center	Land Tenure Collections
Washington State University	Tropical Soils - Screening Crops for Mineral Stress - information and publications

Not included in that list were such centers as the International Fertilizer Development Center (IFDC). Compilation of a current listing is recommended.

Most of these centers conduct a variety of bibliographic, document delivery and information activities with limited budgets. Given the service orientation that is often characteristic of small centers, priority has often naturally been placed upon user services and not upon standardization of cataloging, software selection or cooperation and coordination with major databases like AGRICOLA. The staff of centers interviewed indicated that they would welcome any guidance from NAL that would increase coordination with AGRICOLA. Closer cooperation might enable NAL to capture more fugitive literature for AGRICOLA and strengthen the database and indexing vocabulary in those specialized subject areas. Comparisons of the centers' holdings against the AGRICOLA database are needed to facilitate planning and cooperation.

NAL's library and technical expertise should be injected into the planning process for new centers at the earliest possible stage. Boilerplate language that is intended to provide guidelines and requirements should be developed by NAL and S&T/AGR to be included in AID contract documents and project papers when centers are established. NAL should also develop standards, procedures and service policy recommendations for the centers. Document delivery services established by these centers should be coordinated with services provided from NAL, including AGIES, and means

that will enable the centers to take advantage of technological innovations in use at NAL to speed up communication with developing country clients should be explored.

AID should require that all information centers and clearinghouses provide copies of their annual reports to NAL for review by information systems experts. In turn, NAL should provide guidance to help the centers develop compatible systems and streamline services. NAL should provide technical expertise as appropriate when AID-funded centers and internal S&T/AGR information systems are established. AID should provide travel funds for technical consultation as needed.

3.2 New Services

3.2.1 Liaison

To assure the continuing development of information systems and services that will support the agricultural development process in LDCs, an individual with knowledge both of agricultural information systems and international development is needed to act as a catalyst for new activities and to provide input to existing services and systems. An International Agricultural Liaison for Information Systems, whose sole responsibility is supporting international agricultural development while working closely with NAL, would act as a switching point for locating individuals with technical expertise within NAL who can work on specific projects with AID. The primary objective of the Liaison's activities would be to provide close coordination between the activities of AID and NAL, and to continually identify ways in which NAL can serve AID and developing country agriculturalists and agricultural libraries.

The need for a highly visible and accessible person for AID at NAL was enthusiastically affirmed by most of the individuals interviewed at AID, and also by several agricultural advisors at the World Bank. The Liaison should act as an advisor and coordinator for AID agricultural information projects and programs, and provide international development input to NAL. Existing formal and informal agricultural communication channels could benefit from the Liaison's coordination efforts. For

example, NE/AGR has instituted a very successful newsletter, sent to field staff about every two months, which includes articles that they might not otherwise see. The Liaison should receive and contribute to this informal but effective mechanism for information dissemination. Developing country nationals would also have a contact at NAL for support and information that is out of scope of the services of AGIES and the OICD/TIS. For example, the Liaison should coordinate with activities such as the Depository Libraries program of the World Bank's publications office for the benefit of LDC librarians. The Liaison would also be in a good position to identify and promote databases and information sources in developing countries that are not known outside of their country or region or by AID, NAL, etc. The Liaison would also concentrate on bibliographic control activities, large and small, that do not currently receive direct attention. For example, regular contact with AID's regional bureaus and World Bank advisory and regional offices would permit capture of a large number of "unofficial" consultant and in-house research reports that are currently not sent to any information dissemination unit.

The following suggested position description for a Liaison best describes the nature of the Liaison role that KRI recommends:

INTERNATIONAL AGRICULTURAL LIAISON FOR INFORMATION SYSTEMS

The International Agricultural Liaison for Information Systems will provide a linkage between the National Agricultural Library and agricultural staff and information services of international development agencies. This individual will be responsible for actively coordinating efforts to support LDC agricultural information needs and identifying needed areas of cooperation and/or support to new efforts. As a highly-visible information resource for AID agricultural staff (as well as other donors such as the World Bank, international agricultural research centers and LDC institutions), the Liaison will provide an initial point of contact for the development community and will, when appropriate, direct inquiries to the appropriate unit(s) of NAL for planning and/or solution.

The Liaison must have a good understanding of the international development process, particularly as carried out by AID and the World Bank. (S)He must be able to participate in the project identification process for AID's country and S&T/AGR agriculture projects, and know and maintain close communication with agriculture specialists throughout these and other international institutions. Other Washington-based institutions (e.g., the CGIAR Secretariat, the International Food Policy Research Institute, the National Academy of Sciences, FAO's North American office, etc.), as well as FAS, OICD and other relevant USDA units, would be frequent points of

contact. However, the Liaison must be prepared to travel, when necessary, to aid in the establishment of LDC information services, explore problems or cooperative agreements, etc.

The Liaison will provide input to NAL's policies and programs to ensure consideration of the needs of third world researchers when new information products and services are being developed. (S)He will attend NAL planning sessions for collection development, technology development, technical processing and public services as appropriate. (S)He will also monitor information activities of relevant institutions to determine duplication of effort and identify gaps in bibliographic control and information services for agricultural development. S&T/AGR and other AID programs will be reviewed to determine means that NAL can provide to improve dissemination of AID agricultural project and technical information.

The Liaison will publicize and promote AID's and NAL's services to LDC agriculturalists by all available means, including:

- attendance at the AID Agriculture Development Officers biennial conferences and the World Bank's annual Agriculture Sector Symposia;

- provision of a regular enclosure section to Agricultural Libraries Information Notes focusing on information that would be of interest to agricultural libraries and information centers in LDCs;

- preparation and dissemination of promotional and informative materials to the field through communications mechanisms already established by AID, USIA, NAL, NTIS, the CGIAR and the World Bank, and coordination with established newsletters such as the AID/NE/AGR field newsletter, Front Lines, etc.; and

- active participation in the International Association of Agricultural Librarians and Documentalists (IAALD) and arrangement for contribution to its quarterly bulletin directly or by NAL staff.

The Liaison must have very broad and current knowledge of worldwide activities in control and dissemination of agricultural research and information, particularly, but certainly not limited to, the programs and databases of NAL, the Commonwealth Agricultural Bureaux and FAO. (S)He must be cognizant of the various constraints on access to information in LDCs and be able to plan with donor organizations viable programs to provide appropriate products and services in developing country environments. The Liaison shall assist in early identification and establishment of AID-funded research centers, including determining areas that could be supported by NAL staff and providing standards, specifications, guidelines and promotional channels for new centers.

The Liaison shall identify and arrange for NAL's receipt of ephemeral and "grey" research literature produced throughout AID. The Liaison must have a sufficiently detailed knowledge of the current state of bibliographic control of these items and how information is generated in

international development and agricultural research institutions to identify and fill such gaps. (S)He must maintain frequent contact with agriculturalists and agricultural reference librarians to identify new areas of interest, needed areas of coverage and particular needs of AID mission staff and LDC researchers. (S)He will coordinate with AGIES and OICD Technical Inquiries Service staff to identify training needs and areas of interest of users of those services, and means of making them more accessible, improving turnaround time, etc.

The Liaison will be an initial contact point for foreign visitors to NAL, and will arrange for appropriate training to be provided for visiting librarians and researchers. Further, (s)he will work with OICD's Office of International Training to identify and plan new training courses and to coordinate with existing courses that would benefit from inclusion of a library/information component.

3.2.2 CGIAR

A new project of potential interest to S&T/AGR is in the developmental stage at the Secretariat of the Consultative Group on International Agricultural Research (CGIAR). In order to improve access, currently and retrospectively, to research generated by the thirteen CGIAR research centers6, the Secretariat conducted a study of the feasibility of a proposal to collect, catalog, film, market and distribute a microfiche set of CGIAR center technical reports and publications. The study compared coverage of the centers' publications by AGRIS, CAB and AGRICOLA, and the results show that indexing coverage of those materials is far from complete (see Table 1, p.11). This finding, coupled with difficulties in obtaining copies of materials that are cited, indicate that production of a complete set of fiche, accompanied by a printed index, would greatly improve the availability of information generated at CGIAR centers, and it was determined that production would be possible at a reasonable cost.

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6 International Rice Research Institute (IRR), International Maize and Wheat Improvement Center (CIMMYT), International Institute of Tropical Agriculture (IITA), International Center for Tropical Agriculture (CIAT), West African Rice Development Association (WARDA), International Potato Center (CIP), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Board for Plant Genetic Resources (IBPGR), International Laboratory for Research on Animal Diseases (ILRAD), International Livestock Center for Africa (ILCA), International Center for Agricultural Research in Dry Areas (ICARDA), International Food Policy Research Institute (IFPRI) and International Service For National Agricultural Research (ISNAR).

Funding responsibilities for the CGIAR microfiche project will probably be shared by the centers themselves and various CGIAR donors. The project is still in the process of being approved by the centers and donors, and NAL has expressed strong support of its design and objectives. As a major CGIAR donor, AID should consider contributing to the funding of the fiche project, possibly by its standard contribution of 25 percent. Such a contribution would be most effectively channeled to the project through NAL.

Another new CGIAR development of interest is the institution of an electronic mail network in the CGIAR system. CGNET has established electronic linkages for sending messages and documents to ten of the centers to date, with the other three (in Africa) expected to be accessible in the near future. A conservative estimate of the economic impact of adopting an electronic data transfer network for the CGIAR is that a savings of $3 million should easily be realized during the period of 1985-1990. This figure represents only the savings of electronic mail over Telex (measured before Telex costs rose sharply) and does not take into account costs of telephone calls or the costs of slow or no communication.7

AID and NAL should actively explore linkages with CGNET to improve communications with the CGIAR centers. Both the AGIES staff and the NAL-AID Liaison should use this network for communicating with the centers. Use of this system is possible immediately at NAL. Also, AID staff who deal frequently with the centers (particular in S&T/AGR) should be made aware of the new communications channel.

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7 CGNET: A Data Transfer Network for the Consultative Group on International Agricultural Research. Final Report. Palo Alto, California: Telematics International. 1984

3.2.3 USIA

The U.S. Information Agency (USIA) Library Programs Division has agreed on the need to cooperate and coordinate its technological developments more closely with AID. Possible areas of cooperation that were discussed with USIA included utilization of online searching capabilities in USIA libraries to access agricultural databases, their use of electronic mail and telecommunications, and what progress and savings might result from coordination with AID.

USIA does provide online searching of DIALOG and NEXIS (Mead Data Central's current affairs and newspaper database) to varying degrees in many of their field libraries, with backup support from the Washington, D.C. library. Post library staff are not trained to respond to technical questions, however, and are not skilled in searching agriculture-related databases. Providing technical information to library clientele is not USIA's mission, nor is such information currently requested. Online searching is being performed in only five posts at this point, however, and growth is dependent upon establishment of communications channels with DIALOG and NEXIS on a post-by-post basis.

USIA now uses ITT's Dialcom for electronic mail communications with European posts, and the State Department cable network is used for all other posts. A telecommunications study is being carried out for USIA, and will be made available to AID when it is finished. USIA would like to cooperate more with AID and the State Department in planning for telecommunications and developing a mission-wide policy. Some of the linkages that have already been established could be used by local individuals who are skilled in online searching for accessing the agricultural databases carried by DIALOG (which currently includes AGRICOLA and CAB, and will include AGRIS later this fall).

The USIA Library Programs Division has also just received permission to install IBM PC's in five of their posts and is now exploring appropriate bibliographic software for use with them. The priorities are for software to automate acquisitions and serials check-in at the post libraries.

AID should continue to keep abreast of how USIA is using technology, particularly in its developing country posts. Where telecommunications channels have been established that provide access to database vendors such as DIALOG, an effort should be made to coordinate with the local AID mission and local libraries and research centers to identify means of allowing agricultural librarians or researchers to access the databases they need through those channels. USIA's use of a commercial telecommunications network for electronic mail should be examined by S&T/AGR as the AGIES Project develops. AGIES should work cooperatively with USIA to plan for information delivery to AID field staff and identify means of promoting AGIES services through USIA field libraries.

3.2.4 Development of New AID-Funded Centers

As research interests change in international and agricultural development, and as information transfer needs are defined and opportunities for meeting them develop, S&T/AGR will want to be able to respond with the creation of appropriate research centers and information systems. The Liaison (see Section 3.2.1) should not only be involved in the process of planning the information support component for identified agricultural research projects, but should take an active role in identifying gaps and blockages in the international flow of agricultural information. The World Bank is currently exploring methods to facilitate the communication of agricultural research in developing countries (focusing particularly on Africa), and productive communication should likewise be established in Washington, D.C. among the individuals and institutions seeking to improve agricultural information transfer. The Liaison should also provide feedback to S&T/AGR that will aid in the planning for research priorities and institutions/centers to support them.

3.2.5 Purchase of Publications by AID Missions

Both the AGIES Project and the OICD Technical Inquiries Service have had limited budgets that enabled them, in the past, to purchase commercial publications occasionally for AID agricultural development officers. This service was considered very valuable by mission staff, providing them with their only efficient and reasonable means of acquiring

needed handbooks, research compendia, and other materials essential to performance of their duties. Most of the AID staff interviewed indicated that the ability to obtain priced publications through AGIES, TIS or otherwise would be of high value to them. S&T/AGR and NAL should explore together ways of establishing a mechanism for purchasing publications through NAL, since NAL has the means for efficiently purchasing materials and doing so at a Federal library discount rate. Establishment of a deposit account system for the missions' use should also be explored.

3.2.6 Donation of Materials to LDC Libraries

Many AID agricultural development officers accumulate large collections of books and professional journals in the course of their work at AID. Often these collections include many items generated in developing countries that are difficult or impossible to obtain (or even know of their existence) in the U.S. Staff interviewed expressed frustration that they have no means to make unique and valuable materials they have collected available to others or to donate expensive journal runs and standard agricultural reference works to developing country libraries who need them.

In Section 3.1.2, KRI recommends a procedure for soliciting donations to NAL to fill gaps in the AGRICOLA database. The majority of the materials in AID office collections, however, will already be in AGRICOLA. These materials, including any donated sets of journals, should be forwarded to LDC libraries through NAL. NAL and S&T/AGR should determine the means for selecting recipient institutions (based upon need and ability to make the materials available to agricultural researchers in their country). NAL should assess the feasibility of dev loping a mechanism to profile and categorize the general interests of the recipient libraries, so that items can be selected for them in a cost-effective manner. The results of this assessment should be reported back to S&T/AGR, including cost implications of labor and shipping charges.

3.2.7 Agricultural Organizations and Meetings Database

NAL is in the process of planning the development of a specialized database that will provide a current directory of individuals, institutions and organizations involved in agricultural development and research. The "Agricultural Organizations and Meetings" database should at least partially address the problem, referred to by many of those interviewed, that mission agriculturalists are isolated and cannot find out what is being done in other parts of the world, or even in other parts of AID. To ensure that relevant information on AID agricultural development activities is added to the database, S&T/AGR should cooperate with NAL to survey AID missions for appropriate data. This activity should be coordinated between NAL and AID by the International Liaison (see Section 3.2.1), who will represent AID and LDC interests in international coverage of the database and will help identify sources for data within AID, and from other donors and international organizations.

3.2.8 Document Delivery and Current Awareness

NAL should investigate the cost-effectiveness of using the new document delivery services of University Microfilms International (UMI), the Institute for Scientific Information (ISI, the publishers of Current Contents), and any other appropriate services. The possibility of negotiating volume discounts (and deposit accounts) and increasing the coverage of agricultural journals in their document bases should be explored with these services, especially those available to the Federal libraries at lower costs obtained through FEDLINK (FEDLINK arranges for Federal goverment libraries to access commercial online search and document delivery systems). This negotiation would be facilitated by an analysis of journal request statistics to identify a core group of frequently-requested titles. The cost-effectiveness of commercial services should be judged against the performance, and cost of improving, AGIES document delivery services to missions and LDCs.

NAL, S&T/AGR and the AGIES contractor should also assess the value and feasibility of producing a journal contents-page photocopy service (similar to Current Contents) for AID mission staff. The intent of such a service would be to complement the AGIES current-awareness searches with a journal content scanning capability for AID agriculturalists. Several interviewees said that Current Contents had been very valuable to them when it and ISI's complementary OATS (Original Article Tear Sheet -- now called The Genuine Article) document delivery system were available to them from AID's Development Information Division (DI). DI has discontinued this service, presumably because it was considered too costly. It may be possible that an inexpensive, in-house contents-page publication could be produced through AGIES which would cover the journals that mission staff cannot obtain, and this alternative should be explored by NAL and S&T/AGR.

3.3 Technological Developments

Recent advances in computing and telecommunications technologies have led to new ways of capturing, storing, retrieving and disseminating information of all types. Several of the new information handling technologies have the potential to provide ready access to information to LDCs at relatively low cost. Many of these technologies are still in the development phase but pilot projects have been set up to evaluate new technologies and they are now beginning to be used in operational projects. Perhaps the most relevant projects, technologies, etc. from the perspective of information dissemination to LDCs are those currently being tested and evaluated at NAL. Some of these are described briefly below.

3.3.1 New Disk Technologies

The most rapidly changing technology related to automated data/information processing is in the area of storage. New disk technologies have proliferated: floppy diskettes, Winchester (hard) fixed disks, optical video disks, optical digital disks, compact laser disks (CD-ROM), etc. All of these new disk technologies are of potential interest to LDCs, largely because they can be connected to small microcomputers for retrieval purposes. Most LDC new technology projects in recent years have focused on microcomputer applications. Thus, some software has been distributed on

floppy diskettes, and some projects have taken advantage of the Winchester technology which enables organizations to share up to 80 million characters, accessible through a small microcomputer. With the exception of the NEH-sponsored project to create a videodisk database of artifacts and art treasures of the People's Republic of China, there has been little application of the newer optical and laser disk technologies. Because of the vast storage potential of these newer technologies (e.g., up to two thousand million characters on the 12 inch laser encoded disk, and up to five hundred fifty million characters on a 5.25 inch compact laser disk), their potential for the distribution of databases to LDCs cannot be ignored.

NAL has a series of projects in process which are based on these disk techologies, including:

- projects to put special topic databases on to laser encoded video disks. These databases included both full text of documents and bibliographic entries. The advantage of encoding the information on the disk rather than using optical techniques is that the text is then fully searchable (down to the level of a single character). With optical storage, the page images can be reproduced and retrieved but text cannot be searched within pages.

- project to put a subset of AGRICOLA on laser compact disk, and to evaluate the performance of the compact laser disk technology relative to the performance of the Winchester disk technology.

- project to use interactive video disk technology for orientation to NAL.

- project to develop training programs using video disk technology.

All of these projects could generate results and prototypes that have direct application to the dissemination of information to LDCs. KRI recommends that the Liaison (see Section 3.2.1) monitor closely these ongoing projects at NAL and advise S&T/AGR on the potential applications to agriculture and AID-related information services and products. In particular, the potential for distributing AID-generated databases (full text, bibliographic, numeric, image, etc.) on either 12 inch or 5.25 laser

disk should be explored at the earliest opportunity. Software for retrieval of information from these disks should be reviewed and evaluated and implications for microcomputer hardware considered so that guidelines for microcomputer acquisition can be prepared.

3.3.2 New Communications Technologies

Developments relating to communications technologies have significantly improved mechanisms for accessing and distributing information at high speeds. The general trend has been a move from analog communications to digital communications which provide faster, more accurate and more efficient transfer of information. With the recent proliferation of satellite availability, new digital communications capabilities can be made available worldwide, although the costs to use such systems are still high. Two applications of newer communications technologies directly relevant to this study are electronic mail and telefacsimile.

Electronic mail has been available for many years but has continuously improved as the communications channels improved. Electronic mail facilities have recently been added to online database search services so that needed documents can be ordered immediately. Electronic mail facilities are used by NAL, CGIAR and USIA. AID personnel have investigated the potential for electronic mail communications between AID/Washington and missions but no services have been implemented yet. KRI recommends that S&T/AGTR establish a pilot project to provide access to electronic mail facilities to the missions, the information centers and clearinghouses and to S&T/AGR personnel. The service can be used for a variety of communications including requests for information and documents, messages, letters, referrals, etc. The pilot project should be operated for a two year period to enable users to become thoroughly acquainted with the system and to develop applications for its use.

Telefacsimile involves the transmission of information over communications channels and reproduction of the information to resemble its original form at the destination. Such services were experimented with by libraries for delivery of documents over long distances and, until recently, not considered cost-effective. However, in the last couple of years, the quality of reproduction of the transmitted documents has been improved and the cost of the facsimile tranceivers (transmitter/receivers) has fallen significantly. Furthermore, many commercial document delivery services are now offering rapid delivery (e.g, within 2 hours) of documents. Examples include ISI's The Genuine Article delivery service which provides articles in the ISI database within 30 minutes of a request but only in the Philadelphia area; UMI's new ARTIFAX service which delivers documents in their Article Clearinghouse within 2 hours or overnight according to need; and Federal Express' ZapMail service which will deliver documents from anywhere in the U.S. to anywhere in the U.S. within 3 hours.

In addition to these commercial services, documents can be sent and received by any organization that has a tranceiver and access to a high speed communications channel (low speed channels could be used but risk the greater probability of noise interference). One reason why the potential for telefacsimile transmission of documents is of considerable relevance to AID is that the hardware costs have fallen so dramatically in recent years. For approximately $3,000 upwards, a telefacsimile tranceiver can be purchased with varying features. This cost may seem high relative to the cost of a computer terminal, but these tranceivers can often function as stand-alone photocopiers, thereby providing justification for puchase.

KRI recommends that the feasibility of establishing telefacsimile tranceivers at AID-Washington, NAL (where telefacsimile is already being experimented with), the information centers and clearinghouses, and the missions be investigated. Such a capability for electronic delivery of documents should be integrated with electronic ordering of documents.

KRI further recommends that the commercial document delivery services also be investigated, particularly those with a document base (e.g., ISI, UMI). Volume discounts for LDCs and AID personnel could then be investigated.

3.3.3 Training and User Education

All of these new services and developments, as well as existing resources, must be continuously promoted and explained to mission staff who do not have the multiplicity of communication mechanisms available to them as do AID/Washington staff. Because of their physical distance from the services and information resources, continual reminders are necessary to ensure that individuals will remember a Washington-based service at the time of their information need. The AGIES project particularly needs to be clearly and actively publicized. Several promotional mechanisms have been mentioned elsewhere in this report (e.g., presentations at agricultural development officers' meetings, publicity through USIA libraries, and direct communication with mission staff. Other promotional activities recommended for AGIES during a 1982 review of the project include a brochure, news releases, regular notices, continuation of IDI training, presentations to groups of AID agriculturalists, etc.

NAL publishes a monthly newsletter, Agricultural Libraries Information Notes (ALIN), which presents news on agricultural information activities, NAL projects and policies, new publications of note, new journals received at NAL, and a listing of upcoming professional meetings and seminars relating to the agricultural sciences or agricultural librarianship. While a very useful newsletter, its focus has been primarily a U.S. one. The new NAL/AID Liaison should provide a regular column or insert to ALIN that deals with items of international interest, particularly information aimed at agricultural librarians, researchers and advisors in developing countries. This would also be a good forum for announcing books or journals available to developing country institutions as donations.

Another very useful route for teaching LDC agricultural researchers about available services and for training LDC agricultural librarians and information workers is the series of short courses offered by the USDA Office of International Cooperation and Development (OICD). OICD's short course catalog is widely distributed, and provides for training on specific topics in agricultural research and development in Washington, D.C. or at host universities in the U.S. The courses are specially designed to meet

the needs of participants from developing countries. As yet, there are no courses dealing with accessing agricultural information or providing agricultural library and information services. The OICD short course program should be reviewed by NAL, S&T/AGR, OICD and the International Liaison for the purpose of planning and designing new courses to train LDC or mission librarians in agricultural information work and information technology, and to train LDC agricultural researchers in accessing literature and information resources in agriculture. NAL should also review and coordinate with existing courses that would benefit from inclusion of an information, library and/or information technology component. Agricultural information sources might be included in a research methods course, for example. Two suggested training topics for LDC agricultural librarians are practical information on automation techniques and the role the library can play in the linkage between developing country agricultural research and extension programs. The Liaison should continually work with S&T/AGR and contact LDC agricultural librarians to identify pertinent training topics. Also, the training implications of new technological developments such as accessing AGRICOLA on laser disks should be planned for and supported by NAL and AID. Furthermore, these new technologies lend themselves to training applications through computer-aided instruction, interactive video disks, etc. Both training programs on the use and capabilities of the technologies, and the use of the technologies for training and educational purposes should be supported.

Finally, there are a number of international and domestic organizations concerned with the ongoing training and development of information workers in agriculture and developing countries. NAL, and particularly the International Liaison, should work with such organizations to promote training of LDC agricultural librarians. Foremost of the professional associations focused particularly on this area is the International Association of Agricultural Librarians and Documentalists (IAALD). Founded in 1955, IAALD has been an effective forum for communication among agricultural librarians internationally, and it provided the impetus for the founding of the AGRIS system and also cooperative efforts between NAL, FAO and the CAB.

IAALD's quarterly bulletin enables members to keep abreast of developments in agricultural information services worldwide. IAALD also sponsored a very useful publication, A Primer for Agricultural Libraries (by Olga Lendvay, 2d ed., 1980), that provides much practical information for non- librarians or librarians with no agricultural background in establishing an agricultural library. The information contained in the Primer would also be useful in many mission settings, where occasional efforts are made to organize mission libraries (usually with minimal, if any, funding or trained personnel). Other relevant international associations include the Education and Training Division of the International Federation for Documentation (FID/ET) and the International Federation of Library Associations and Institutions (IFLA). Both associations have been involved with training, professional development and international cooperation in libraries in developed and developing nations. The U.S.-based Special Libraries Association has an active division dealing with Food, Agriculture and Nutrition, but its current membership includes very few librarians from developing countries, and its focus is primarily on the U.S., Canada and Great Britain.

CAB and FAO have long been involved in projects geared to train agricultural librarians and improve agricultural information services in developing countries. FAO's efforts in this area have focused on training staff in AGRIS-participating countries in indexing and use of AGRIS tapes to produce local bibliographic products. CAB conducts short training courses for agricultural librarians, though those in need of professional-level expertise obtain university training. UNESCO has been the major international organization active in the education and training of library/information specialists and users in developing countries. The NAL/AID Liaison should be aware of (and, where possible, coordinate with) the training programs that exist for developing country agricultural librarians through these and other national and international organizations.

ANNEX A

INTERVIEWS

INTERVIEWS

2 JULY 1985	Robert Morris	S&T/AGR
	Lloyd Frederick	S&T/AGR
	Raymond Meyer	S&T/AGR
3 JULY 1985	Eleanor Frierson	CGIAR Secretariat, World Bank
	Robert Herdt	CGIAR Secretariat, World Bank
8 JULY 1985	Frank Post	National Technical Information Service (NTIS)
9 JULY 1985	Robert Morris	S&T/AGR
	Jim Feaster	S&T/IRM
	Harlan Shuyler	S&T/AGR/AP
	Dana Dalrymple	S&T/AGR
11 JULY 1985	Lesley Kulp	Collection Development Officer - NAL
	Patty Clark	U.S. Information Agency (USIA) Library Technology Coordinator
	Ruth Smith	NTIS Customer Services Division
	Don Hausrath	USIA Delhi Program
12 JULY 1985	Joseph Howard	National Agricultural Library (NAL)
	Sara Thomas	NAL
	Sam Waters	NAL
	Robert Morris	S&T/AGR
	Harry Dewey	AGIES Project Contractor
15 JULY 1985	Wilbur Thomas	NE/TECH/AD
	Doug Pickett	ASIA/TR/ARD
	James Dunn	NE/TECH/AD
	Dwight Steen	LAC/DR
	Judy Russell (and NAL staff)	Disclosure, Inc.
16 JULY 1985	Judy Hunt	NTIS
	Richard Fitz	Library, USIA
18 JULY 1985	Paulette George	University of Idaho, Postharvest Institute for Perishables Information Center (PIPIC)
	Donna Hamlin	Kansas State University, Postharvest Documentation Service (PHDS)
	Stuart Wiseman	NTIS
	Walter Finch	NTIS, Office of Program Development
	Sara Thomas	NAL
19 JULY 1985	Ken Prussner	AFR/TR/ARD

25 JULY 1985	Dana Lund	M/PM
1 AUGUST 1985	Joseph Howard	NAL
	Sara Thomas	NAL
	Sam Waters	NAL
	Robert Morris	S&T/AGR
	Robert Jackson	S&T/AGR
23 AUGUST 1985	Carroll Collier	S&T/AGR

ANNEX B

AID/NAL DRAFT MEMORANDUM OF UNDERSTANDING

AID/NAL DRAFT MEMORANDUM OF UNDERSTANDING

The purpose of this Memorandum of Understanding (MOU) between the S&T Agriculture Office of the Agency for International Development (AID/S&T/AGR) and the National Agricultural Library (NAL) is to provide a mechanism whereby AID and NAL can explore together various means for improving agricultural information services to AID missions and scientists in lesser developed countries (LDCs). The following projects, tasks and subjects of inquiry fall within the scope of the MOU. The exact nature and funding of many of the tasks to be performed shall be negotiated by NAL and S&T/AGR. Some of the projects have financial implications for which NAL will submit cost estimates to S&T/AGR.

1. Agricultural Information and Exchange System (AGIES) Project

Provisions shall be made to achieve a closer integration of AGIES Project services with the planning process and current services of NAL. Particular areas and products requiring more coordination include: work with NAL's reference staff to exploit particular strengths of subject expertise and coordinate the production of "Quick Bibliographies" with AGIES retrospective and current-awareness computer searches; attendance at NAL collection development meetings by the AGIES project manager, and provision of suggestions for new vocabulary, new lending services etc., as identified in the course of providing AGIES services; and cooperation with NAL's Lending Division to streamline photocopy and document delivery procedures.

NAL, S&T/AGR and the AGIES contractor agree to examine the use of new telefacsimile technology for speeding the document delivery process to AID missions. AGIES shall also begin using electronic mail communications where possible to and from field missions, to speed communication of requests and SDI profile development. Further, funding of the AGIES Project will

include an allowance for long-distance telephoning to Missions, to be instituted as a pilot project; at the end of the test period, NAL will make recommendations to S&T/AGR concerning the cost-effectiveness of this method of communicating with field staff and the respective roles of long distance telephone and electronic mail for communications.

AGIES staff shall continue to investigate various means of improving communications with their users, focusing on periodic user follow-up to determine whether searches are still useful and relevant. NAL will cooperate with S&T/AGR and AGIES staff to improve and increase marketing and promotional activities associated with AGIES. The level of travel funding necessary to further this end should be provided to the AGIES project.

S&T/AGR, NAL and AGIES shall establish clear guidelines as to the scope and definition of services provided under the AGIES project. It is recommended that AGIES concentrate on document delivery, SDI searches and the development of accurate user profiles with initial retrospective database searches. The usefulness to field staff of increasing the use of other agricultural and biological databases should be investigated. The objective is to promote a service to AID field staff that is clearly understood and delineated from other information services available to them.

2. International Agricultural Liaison for Information Systems

A liaison officer is required to coordinate activities between S&T/AGR and NAL. The specific responsibilities of this position are detailed in Attachment A to this Memorandum of Understanding. Logistics of creation, funding and reporting requirements of this position will be determined by NAL and S&T/AGR.

3. NAL shall investigate the cost-effectiveness of using new document delivery services of University Microfilms International (UMI) and any other appropriate commercial services. The possibility of negotiating volume discounts (and deposit accounts) and increasing the coverage of agricultural journals in their document bases should be explored with these services. This negotiation would be facilitated by an analysis of journal request statistics to identify a core group of frequently-requested titles. The cost-effectiveness of commercial services will be judged against the costs of improving NAL's in-house document delivery services. The potential for telefacsimile transmission of documents from commercial and in-house services will also be addressed.

   NAL, S&T/AGR and the AGIES contractor will also assess the value and feasibility of production of a journal contents page photocopy service (similar to the Institute for Scientific Information's Current Contents) for AID mission staff. The intent of this service is to complement the AGIES current-awareness searches with a journal contents scanning capability for AID agriculturalists.

4. NAL and AID agree to investigate mechanisms to allow efficient purchase of commercial publications by Mission staff. They will also explore the use of NAL's deposit account system with NTIS for photocopies and materials supplied to Missions, beyond those available through the AGIES project.

5. NAL shall establish means of acquiring research materials from International Agricultural Research Centers (IARCs) more completely, considering purchase of microfiche collections, review of publications catalogs, etc. Contacts and communication with these centers should be strengthened by the AGIES project and the International Liaison. The cataloging of serially-published items from IARC's shall be reviewed to determine whether sufficient subject and bibliographic access is provided to individual titles within series.

6. The Agricultural Libraries Information Notes newsletter, which is produced by NAL, will include a column or insert of international interest, produced by the International Agricultural Liaison for Information Systems.

7. NAL & S&T/AGR agree to explore means of enabling NAL to capture nonconventional literature that should be in the AGRICOLA database by soliciting donations from active and retiring AID staff who may have accumulated collections of relevant materials from developing countries. S&T/AGR will establish a formal mechanism within AID to request materials from AID staff on an ongoing basis, and shall be responsible for forwarding those materials to NAL's Exchange and Gifts Division. NAL will review materials received from AID to identify in-scope items that are not already in the NAL collection and to recommend those which should be included in AGRICOLA.

   NAL will investigate means by which it might enable AID staff to donate materials to LDC libraries through NAL. NAL will assess the feasibility of developing a mechanism to profile the interests of recipient institutions and forward materials to them, and will report back to S&T/AGR a proposal on how this might be accomplished, including cost implications.

8. NAL and S&T/AGR shall review USDA/OICD short courses for the purpose of planning and designing new courses to train LDC or mission librarians in agricultural information work and information technology, and to train LDC agricultural researchers in accessing literature and information resources in agriculture. NAL will also review and coordinate with existing courses that would benefit from inclusion of an information, library and/or technology component.

9. NAL and S&T/AGR agree to continue to explore Compact Disk - Read Only Memory (CD-ROM), optical digital and video disk and microfiche technology for future distribution of the AGRICOLA database, the NAL Catalog, and other appropriate applications. Large-sized digital optical disks that have the capacity to hold the entire AGRICOLA database will be considered. Planning for site testing of new products shall include integrated workstation concepts, developing country installations, and determination of what information will be included on disks and fiche should consider unmet needs and markets in developing countries. The needs of countries for which telecommunications access to agricultural databases is impossible or too costly will be prominently considered in development of technologies that are not dependent upon telecommunications. Those needs will be identified and defined by the International Agricultural Liaison in close coordination with NAL, AGIES, AID and other LDC and development institutions.

10. S&T/AGR agrees to coordinate with NAL to survey AID missions to identify information for the "Agricultural Organizations and Meetings" database, currently in the planning stages at NAL. Planning of the database will include an investigation of means of providing LDC and Mission staff access to it. The International Liaison will represent AID and LDC interests in international coverage in the database and will help identify sources for data within AID, and from other donors and international organizations.

11. NAL and AID agree to explore recent technological developments that enable telefacsimile transmission of documents from microfiche, so that document storage and delivery are optimized. The relative tradeoffs between microfiche storage and the use of electronic media (CD/ROM, optical digital disk, etc.) need to be evaluated.

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12. NAL agrees to establish a closer relationship with AID-funded agricultural information centers such as the Postharvest Institute for Perishables Information Center at the University of Idaho and the Kansas State University Postharvest Documentation Service. NAL will consider avenues by which coordination of bibliographic control activities and information services may be achieved with those centers, to ensure the capture of relevant bibliographic data for the AGRICOLA database.

NAL will develop appropriate contract language, for approval by S&T/AGR, intended to provide guidelines and requirements for new AID-funded information centers that can be included in AID contractual documents establishing such centers. NAL agrees to develop standards, guidelines, procedures and service policy recommendations for the establishment of new AID-funded centers. Document delivery services established by these centers will be coordinated with services provided from NAL, including AGIES, and means will be explored that will enable them to take advantage of technological innovations that speed communication with developing country clients.

AID agrees to require that all information centers and clearinghouses provide copies of their annual reports to NAL through the International Liaison. The Liaison will ensure that developments at these centers benefit from review of their activities by NAL information systems experts and that guidance is provided to help the centers develop compatible systems and streamline services.

NAL agrees to provide technical expertise as appropriate for the establishment of AID-funded information centers and for development of internal S&T/AGR information systems. AID agrees to consider providing travel funds for technical consultations as needed. The International Agricultural Liaison for Information Systems will act as a switching point for locating individuals with technical expertise within NAL who can work on specific projects with AID. The objective of the Liaison's activities shall be to provide close coordination between the activities of AID and NAL, and to continually identify ways in which NAL can serve AID and its developing country constituents.

13. NAL and S&T/AGR agree to explore the potential value of NAL's Translations Program to AID mission staff. The most effective means of exploiting NAL's translation services will be evaluated.

POSITION DESCRIPTION FOR
INTERNATIONAL AGRICULTURAL LIAISON FOR INFORMATION SYSTEMS

The International Agricultural Liaison for Information Systems will provide a linkage between the National Agricultural Library and agricultural staff and information services of international development agencies. This individual will be responsible for actively coordinating efforts to support LDC agricultural information needs and identifying needed areas of cooperation and/or support to new efforts. As a highly-visible information resource for AID agricultural staff (as well as other donors such as the World Bank, international agricultural research centers and LDC institutions), the Liaison will provide an initial point of contact for the development community and will, when appropriate, direct inquiries to the appropriate unit(s) of NAL for planning and/or solution.

The Liaison must have a good understanding of the international development process, particularly as carried out by AID and the World Bank. (S)He must be able to participate in the project identification process for AID's country and S&T/AGR agriculture projects, and know and maintain close communication with agriculture specialists throughout these and other international institutions. Other Washington-based institutions (e.g., the CGIAR Secretariat, the International Food Policy Research Institute, the National Academy of Sciences, FAO's North American office, etc.), as well as FAS, OICD and other relevant USDA units, would be frequent points of contact. However, the Liaison must be prepared to travel, when necessary, to aid in the establishment of LDC information services, explore problems or cooperative agreements, etc.

The Liaison will provide input to NAL's policies and programs to ensure consideration of the needs of third world researchers when new information products and services are being developed. (S)He will attend NAL planning sessions for collection development, technology development, technical processing and public services as appropriate. (S)He will also monitor information activities of relevant institutions to determine duplication of effort and identify gaps in bibliographic control and

information services for agricultural development. S&T/AGR and other AID programs will be reviewed to determine means that NAL can provide to improve dissemination of AID agricultural project and technical information.

The Liaison will publicize and promote AID's and NAL's services to LDC agriculturalists by all available means, including:

1. Attendance at the AID Agriculture Development Officers biennial conferences and the World Bank's annual Agriculture Sector Symposia;

2. Providing a regular enclosure section to Agricultural Libraries Information Notes focusing on information that would be of interest to agricultural libraries and information centers in LDCs;

3. Preparing and disseminating promotional and informative materials to the field through communications mechanisms already established by AID, USIA, NAL, NTIS, the CGIAR and the World Bank, and coordinating with established newsletters such as the AID/NE/AGR field newsletter, Front Lines, etc.; and

4. Active participation in the International Association of Agricultural Librarians and Documentalists (IAALD) and arranging for contribution to its quarterly bulletin directly or by NAL staff.

The Liaison must have very broad and current knowledge of worldwide activities in control and dissemination of agricultural research and information, particularly -- but certainly not limited to -- the programs and databases of NAL, the Commonwealth Agricultural Bureaux and FAO. (S)He must be cognizant of the various constraints on access to information in LDCs and be able to plan with donor organizations viable programs to provide appropriate products and services in developing country environments. The Liaison shall assist in early identification and establishment of AID-funded research centers, including determining areas that could be supported by NAL staff and providing standards, specifications, guidelines and promotional channels for new centers.

The Liaison shall identify and arrange for NAL's receipt of ephemeral and "grey" research literature produced throughout AID. The Liaison must have a sufficiently detailed knowledge of the current state of bibliographic control of these items and how information is generated in international development and agricultural research institutions to identify and fill such gaps. (S)He must maintain frequent contact with agriculturalists and agricultural reference librarians to identify new areas of interest, needed areas of coverage and particular needs of AID mission staff and LDC researchers. (S)He will coordinate with AGIES and OICD Technical Inquiries Service staff to identify training needs and areas of interest of users of those services, and means of making them more accessible, improving turnaround time, etc.

The Liaison will be an initial contact point for foreign visitors to NAL, and will arrange for appropriate training to be provided for visiting librarians and researchers. Further, (s)he will work with OICD's Office of International Training to identify and plan new training courses and to coordinate with existing courses that would benefit from inclusion of a library/information component.

ANNEX C

AGRICOLA SELECTION, SCOPE, AND COVERAGE OUTLINE

SECTION 2

SELECTION, SCOPE, AND COVERAGE

SELECTION, SCOPE, AND COVERAGE

These notes on selection, scope, and coverage for AGRICOLA bibliographic records prepared by the Indexing Branch should be applied only to publications that the Journal Evaluation Panel has already designated "Keep" in the List of Journals Indexed (LJI) computer file. They do not reflect the unique criteria of the other AGRICOLA subfiles.

Criteria used by the Journal Evaluation Panel are based on current NAL management policies and on current staffing constraints.

As of March 8, 1985, a shift in priorities was introduced to reflect a change in AGRICOLA's makeup and in NAL's mission and goals. This shift broadened AGRICOLA's scope: (1) to cite not only research material but to include other material of interest to agriculturists and (2) to avoid as much duplication with other agricultural databases, such as AGRIS and CAB. AGRICOLA will also be an index to documents in agriculture that are not necessarily held at NAL.

The following priority handling of journals will affect the title-by-title selection of journals within each of the coverage and journal literature subject areas.

Priorities by Coverage

Priority 1	USDA and State Publications (state experiment station and extension service)
Priority 2	United States imprints
Priority 3	Non-U.S., English language material, not indexed elsewhere
Priority 4	Foreign language, not indexed elsewhere
Priority 5	English language material, indexed elsewhere
Priority 6	Foreign language material, indexed elsewhere

Priorities by Journal Subject Area

CORE	RELATED	PERIPHERAL
Agriculture (General)	Biochemistry	Computer Science
Animal Production	Biology	Geology
Aquaculture	Chemistry	Law
Economics (Agricultural)	Conservation	Library Science
Education (Agricultural)	Cytology	Physical Geography
Engineering (Agricultural)	Energy	Physics
Entomology	Hydrology	Transportation
Farm Management	Landscape	Weather/Climate
Feed Processing & Manufacture	Natural History	
Food and Non-Food Processing & Manufacture	Physiology	
Forestry	Pollution	
History (Agricultural)	Public Health	
Human Ecology	Wildlife	
Invertebrates (other than insects)	Zoology	
Microorganisms		
Nutrition (Human)		
Plant Production		
Plant Protection		
Rural Sociology		
Soil Science		
State Cooperative Extension Publications		
State Experiment Station Publications		
USDA Publications		
Veterinary Medicine		

On the following pages each of these subjects, listed alphabetically, is discussed as to selection, scope, and coverage as it relates to agriculture, fisheries, and forestry for the indexing portion of the AGRICOLA database as prepared by the Indexing Branch. Non-subject selection criteria are also addressed.

The final decision to index or not to index a given article depends upon the merits of the particular article itself, its origin, and administrative and indexing policies. For example, much of the information contained in Federal and State extension publications is journalistic in style and may be available from other sources. However, NAL usually includes such materials in AGRICOLA because of their relationship to USDA funding and programs. The same is true of most State Agricultural Experiment Station publications.

Notes

Special Projects Publications

Selection, scope, and coverage criteria applicable to Special Projects publications do not necessarily follow those criteria used for routinely indexed journals.

Each Special Project has its own criteria.

USDA Authors

Almost any article written by a USDA employee in the pursuit of his/her official duties is considered in scope by virtue of its relationship to USDA programs and funding.

Such articles have an implied, if not explicit, connection with agriculture, fisheries, or forestry.

These articles are usually written by Agency Heads or higher, or by USDA employees acting in their professional capacities, as forest rangers, soil scientists, dairy scientists, laboratory technicians, economists, microbiologists, biochemists, agricultural engineers, soil conservationists, and the like.

Selection, scope, and coverage criteria applicable to articles authored by USDA personnel do not necessarily follow those criteria used for routinely indexed journals.

Definitions applicable to this section of the Indexing Manual:

scope -	Limits of the subject areas with which indexing portion AGRICOLA is concerned.
coverage -	Extent of completeness or exhaustiveness with which the subjects considered in scope are pursued.
literature -	Information not only in printed form but also in microform or other non-print media.
agriculture -	"The science of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation of these products for man's use and their disposal as by marketing" [Webster].
core subjects -	Basic agricultural subjects considered essential for indexing purposes.
related subjects -	Physical and life sciences closely affecting agriculture.
peripheral subjects -	Subjects which have a minimal relationship to agriculture but which do contribute significant, though limited, information for indexing purposes.

AGRICULTURE (GENERAL) CORE

General description of U.S. and world agriculture when agriculture represents a significant part of the article not merely a brief mention.

Includes but not limited to

Works on agriculture, fisheries, and forestry in its wide sense from agricultural institutions, societies, cooperatives, and chambers of agriculture.

Excludes

Articles that cover a country in general and merely touch on agriculture as one of many industries.

Statistical articles that list agriculture as one of many topics covered.

ANIMAL PRODUCTION

CORE

General and specific animal husbandry.

Includes but not limited to

- General production and care of domestic animals: rearing, judging, testing, training, housing (construction of barns, etc., is agricultural engineering but housing requirements in relation to the animal itself are in scope for Animal Production), identification (e.g., branding), sexing, pen-raised fur animals.
- Livestock biology: anatomy, cytology, histology, physiology, paleontology, rumen microorganisms and their biology (livestock pathology is Veterinary Medicine).
- Natural animal behavior, communication, instinct, learning.
- Animals in relation to their environment, including habitat, climatic factors that affect habit.
- Effects of external influences on biological processes in domestic and non-aquatic animals.
- Wildlife articles that take place in National Parks or National Forests.
- Livestock feeding: feed, animal nutrition, nutritive value of feeds, feed formulas, effects of feeding on animals, feed supplements, feedlots.
- Livestock breeding: breeds, breed performance, artificial insemination, normal reproduction (abnormal reproductive physiology is Veterinary Medicine).
- Animal wildlife management as it relates to the supply of grasses and other natural resources that the animal requires.

Excludes

- Purely sporting and racing articles (physiology of muscles in a racehorse, however, is animal physiology), pigeons, cockfighting (unless from a breeding, feeding, or disease angle), animals used for experiments in human medicine where the disorder is only found in humans, animal extracts (except extracts from insects).

Laboratory Animals

Includes articles dealing with the care, handling, and management of laboratory animals/colonies, excluding primates, and their indigenous diseases of interest to veterinarians and agricultural research institutes.

Articles merely written by veterinarians or agricultural research institutes are not necessarily in scope; the subject matter must be considered appropriate.

Excludes articles dealing with induced diseases of laboratory animals or other experimentation with them unless of interest to veterinary medicine as related to agriculture (livestock production, food inspection, etc.).

Notes

Animals which are considered domestic in one country may not be so designated in another. Example: In the United States the elephant is not considered a domestic animal, but in India it is. When indexing animal articles, the indexer should consider the region in which the animal is being used.

Articles in human medicine journals which deal with cats, dogs, sheep, cows, pigs, etc., are handled as follows:

Articles involving the larger domestic animals (e.g., pigs, sheep, cattle, horses) which can be related to natural conditions or problems developing in these animals are considered in scope.

Articles involving small domestic animals (.e.g., chickens, cats, dogs) are considered in scope only if the condition is natural to the animal or in the case of a disease, the disease naturally occurs in that animal.

Articles using chick embryos, animal extracts (except extracts from insects), or miscellaneous parts of domestic animals only as growing media (when the condition being studied is not natural to the animal) are not taken.

AQUACULTURE

CORE

Beginning January 1, 1985, aquaculture indexing is being handled by Cambridge Scientific Abstracts (CSA), Bethesda, Maryland. Subjects of interest include

> "references to publications on the culture of fish, other vertebrates, crustaceans, mollusks, other invertebrates, aquatic plants, algae, aquatic protozoa and microorganisms. The biology and ecology of cultured species are included where directly relevant to aquacultural situations. Aquaculture for purposes of human and animal food supply, stocking of natural populations, sport fishing, laboratory culture or other purposes are included, as are stocking of organisms artifically by man, and the culture of species in aquaria" (From Foreword in ASFA Aquaculture Abstracts, ISSN 0739-814X, 1984).

As part of the agreement with CSA, Indexing Branch will be responsible for selecting and indexing USDA, State Experiment Station, and State Cooperative Extension Service publications on all phases of aquaculture.

The only aquaculture-related journal articles Indexing Branch will select and index will be those that deal exclusively with the agricultural application of aquacultural organisms; e.g., seaweed used as livestock feed.

Currently, this arrangement with CSA is encumbent only on the Indexing Branch of NAL and does not apply to the other AGRICOLA subfiles.

Journal articles falling within this subject area that Indexing Branch would normally have processed will now appear in

> ASFA Aquaculture Abstracts
> (ISSN 0739-814X) published and
> printed by Cambridge Scientific
> Abstracts, 5161 River Road,
> Bethesda, Maryland 20816

This publication has been issued quarterly since 1984. It represents a compilation of aquaculture-related references contained within the ASFA [Aquatic Sciences and Fisheries Abstracts] database. Each issue contains abstracts followed by author, subject, taxonomic, and geographic indexes.

The coordinators of ASFA (namely, UN, FAO and IOC) have formed the Aquatic Sciences and Fisheries Information System (ASFIS) of which ASFA is a module. From January 1978 the entire ASFA database has been available in tape format and through major online vendors, such as DIALOG's Aquatic Sciences and Fisheries Abstracts database.

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BIOCHEMISTRY

RELATED

General biochemistry journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

- Livestock.
- Food fish.
- Plants,
- Insects.
- Metabolism of nutrients in humans.

General biology journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

CHEMISTRY

RELATED

General chemistry journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

COMPUTER SCIENCE PERIPHERAL

Computer science journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Computer programs applied to forestry, crop simulations, economic forecasting, farm management, commodities marketing, economic modeling, measuring photosynthetic and animal metabolic processes, weather modeling, watershed modeling, livestock feeding simulations.

Impact of technology on rural environments and rural communities in developed and developing countries.

CONSERVATION

RELATED

For an article to be considered in scope planned management of natural resources must have a direct connection with agriculture, fisheries, or forestry.

Includes but not limited to

- Plant wildlife management.
- Preservation of the wild grasses, etc., and water necessary to support animal wildlife.
- National Parks.
- Restoration/reclamation of natural environment.
- Recreational land in wilderness areas, especially if a National Park or Forest.
- Animal wildlife management.

CYTOLOGY

RELATED

General cytology journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Wood structure.
Microscopic structure of food, feed, other agricultural products.
Microscopic structure of plant, insect, and livestock tissue.

ECONOMICS (AGRICULTURAL) CORE

Articles on agricultural economics are in scope for the Indexing Branch portion of the AGRICOLA database if they are not from journals designated in the List of Journals Indexed file as being the exclusive province of the American Agricultural Economics Documentation Center. AAEDC maintains its own selection criteria for articles processed by that organization for its AGRICOLA subfile.

Includes but not limited to

- Economics of synthetic products when the products are in competition with agricultural products and this comparison is clearly made.
- Land economics: land settlement and colonization, land classification, utilization, tenure, farm mergers, location theory, land reform, land surveys, valuation, zoning, ownership, regional planning involving land only, recreational use of farm land.
- General description of U.S. and world economies when at least one-half of the article is devoted to agriculture.
- Macroeconomic theory involving aggregates or whole systems of individual or groups of commodities as in total consumption, employment, or income.
- Economic analysis: economic forecasting, economic appraisal.
- Agricultural situation and outlook.
- Economic planning.
- Labor: manpower, employment, unemployment, migratory or contract labor.
- Economic modeling, econometrics.
- General farm organization.
- Agricultural credit and financing.
- General agricultural taxation.
- General agricultural accounting.
- General agricultural investment.
- General agricultural income, wages, pay for labor.
- Marketing and distribution of food and feed products; cooperatives.
- Consumer economics: consumer price index, buying habits and preferences, consumer movements.

EDUCATION (AGRICULTURAL) CORE

Local, national, and international education plans, policies, and programs.

Includes but not limited to
Agricultural teaching, demonstrations, extension and advisory work.
Short courses, correspondence courses.
Schools, colleges, etc.
Television, radio, agricultural journalism.

ENERGY RELATED

For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

- Conservation and expenditure of energy in production, processing, marketing, and use of crops, livestock, forestry, etc., in rural housing, transportation and development.
- Rural electrification.
- Energy in food/feed processing.
- Biomass energy sources.
- Alternative sources of energy: solar, wind, geothermal, coal, lignite, oil shale, peat waste heat, wastes, hydropower, photovoltaics, etc.
- Consequences of energy production and use: social implications, land use, population, radiation, ozone, pollution, etc.

ENGINEERING (AGRICULTURAL) CORE

General and specific articles on the design, materials, construction, and maintenance of farm machines and equipment.

Includes but not limited to

- Cultivation, tillage, fertilization, planting, harvesting, spraying, dusting equipment.
- On-farm processing equipment.
- Hand and power machines/tools.
- Farm safety and accident prevention equipment.
- Storage structures.
- Walls and fences.
- Rural roads.
- Farm water supply systems.

ENTOMOLOGY CORE

All entomological literature is taken on the theory that it is all of potential interest to agricultural researchers.

For convenience, certain other arthropods of interest to agriculturists are included under the heading of entomology; namely, millipedes, centipedes, ticks, mites, sowbugs, pillbugs, and the like.

Includes but not limited to

Insect parasites or pests of man and other animals.
Apiculture.
Sericulture.
Extracts from insects.
Human medicine if the insect is extensively discussed.
Insects for biological control.
Drosophila and other insects as test organisms.
Insects as vectors of disease organisms.
Insects as pests of food, feed, and non-food products.

FARM MANAGEMENT CORE

Organization and operation of farm management systems.

Microeconomics as it relates to individual producers, small groups, or single commodities.

Includes but not limited to

- Costs and returns of farm operations.
- Production economics.
- Administration/management of farm resources.
- Systems of farming: private, collective, state farms; contract, part-time, cooperative, corporation, and tenant farming (cash tenancy, share tenancy, etc.).
- Labor requirements as they relate to productivity of workers.
- Management of crops in the field is Plant Production.
- Management of livestock is Animal Production.

FEED PROCESSING & MANUFACTURE CORE

Feed science and products in general and specifically.

Includes but not limited to

- Feed processing and storage.
- Microbiology of feed processing; e.g., fermentation, enzymes, single cell protein, etc.
- Feed contamination and toxicology, including spoilage, adulteration.
- Feed composition.
- Grading, standards, and labelling of feeds.
- Legislation relating to feed grading, standards, and labelling (this is considered Law).
- Public health as it is affected by contaminated feed; e.g., residues.
- Planning and development of the feed industry.
- Preservation and storage of processed feed.
- Marketing and distribution of feed products (this is considered Economics).
- Feed processing equipment if it is concerned with the properties of raw materials or contamination.

FOOD AND NON-FOOD PROCESSING & MANUFACTURE (Except FEED (q.v.)) CORE

Articles on agricultural products are taken only through the primary processing stages. Articles on manufacturing processes after primary off-farm processing are taken only when they are affected by properties of the raw materials or as they relate to consumer protection (standardization, inspection, quality control, contamination, etc.).

Includes but not limited to

- Textiles from natural fibers through the spinning process; e.g., rot-proofing, waterproofing, fireproofing, etc. Further processing states are taken only when emphasis is on the properties of the natural fiber.
- Tobacco as a raw product or derivative but not cigar or cigarette manufacture, unless emphasis is on the raw material.
- Natural rubber is taken through initial processing of the latex. Articles on further processing or on synthetic rubber taken only as they relate to the properties of the natural rubber.
- Food products taken through all stages of processing, but not in relation to the machinery, management and labor, or economics of their manufacture unless that aspect is concerned with the properties of raw materials or contamination.
- Extracts from insects and plants but not from domestic animals (unless related to agricultural subject in other categories).
- Care, storage, refrigeration, and sanitation procedures for food and non-food agricultural products.
- Industrial utilization: chemurgy, analysis and composition. Processing: preparation methods such as pasteurizing, curing, canning, dehydrating, freeze-drying, freezing, preserving, irradiation, etc. (See Human Ecology for home processing of food.)

FORESTRY

CORE

General aspects of forestry: associations; history; education; social and economic aspects of forestry as a whole; forest influences: effects on water supply, climate, and health resulting from presence of forests; shelterbelts and windbreaks; watershed management; forest fire research.

Includes but not limited to

- Economics and management: Business economics of domestic and foreign forestry; forest finance, costs and returns, valuation, statistics; administration, organization of forest enterprises; taxation, labor, regulation and legislation.
- Forest engineering, including construction costs and problems of maintaining public areas in National Forests; forest road construction and maintenance; forestry and silvicultural equipment; transport of forest products from the forest to the mill; site clearing, grading, slope stability; avalanches in forest areas.
- Forest products: Properties of wood, composite and reconstituted wood, pulp and paper, chemicals and miscellaneous products derived from forest species. Processing of forest products when the raw material is involved; e.g., pulp and paper are taken through the pulping process but no paper processing except as affected by the properties of the wood or natural fiber.
- Harvesting: Logging and other forms of harvesting; primary processing and on-site storage of forest products.
- Land-use policy, including multiple use for maximum efficiency, management of recreational areas on forest lands, parks, grazing in National Forests; farm woodlands, private forests; conservation.
- Occupational health and safety.
- Silviculture: Silvicultural systems; natural and artificial regeneration, breeding, seed production; stand improvement; including Christmas trees and forest nurseries; controlled burning, general forest husbandry; afforestation; reforestation; silvicultural equipment and structures.
- Trade, marketing: Transport of forest products to market, including railroads for specific transport of logs/lumber. Local, national, international trade/marketing.
- Wood technology: Wood in all its aspects; identification, structure, chemical, mechanical and physical properties; cellulose and lignin research.

GEOLOGY

PERIPHERAL

For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Paleobotany.
Paleoentomology.
Fossilization of ancient forms of livestock.

HISTORY (AGRICULTURAL) CORE

Includes but not limited to

Agricultural history in general and specifically: prehistoric, ancient, medieval, and modern.

Biographies, obituaries of persons in agriculture, fisheries, and forestry particularly USDA personnel (usually Agency Head or higher; professionals such as forest rangers, veterinarians, cereal chemists, geneticists).

HUMAN ECOLOGY CORE

Includes but not limited to

General information about human ecology; family health; hygiene; safety; pet care.

Elementary, secondary, and adult education in human ecology: career development; home based businesses; job enrichment; training displaced homemakers; curriculum guides.

Family economics and management: lifelong financial management including health care costs and estate planning and managing resources.

Family relationships and child development: parenting; family life; child care; daycare; latch key children; discipline; adult development; child/adult abuse; substance abuse; divorce; death; leisure activities.

Food and meal preparation: Home food selection; preparation and storage; home food preservation; food safety; cookbooks (general).

Household textiles and clothing: planning clothing needs, purchasing, construction and remodeling skills; fashion merchandising and retailing; fashion illustration and design; adapting clothing for the elderly and handicapped.

Housing, home furnishings, and surroundings: energy use and conservation in the home; repair and maintenance of housing and furnishings; purchase plans; building; remodeling/interior design; equipment; financing for homes.

HYDROLOGY RELATED

General hydrology journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

- Water supply, conservation, quality, and management practices.
- Snow surveys.
- Design and methods of drainage, irrigation, desalinization.
- Flood control and forecasting.
- Groundwater prospecting.
- Water chemistry.
- Water conveyance and distribution.

INVERTEBRATES (other than insects) CORE

Includes but not limited to

Articles on crustaceans (other than those included with insects) if the organisms are treated as food/feed or have other agricultural, fishery, or forestry implications.

Annelida as they affect plants, livestock, or soil.

Mollusca if the organism is treated as a food/feed or has other agricultural implications (e.g., snails, slugs).

All invertebrates which are parasitic in or on domestic animals and/or plants.

LANDSCAPE RELATED

The complex of landforms of a region.

Includes but not limited to
Landscape management.
Landscape and scenery preservation.
Estate gardens.

LAW

PERIPHERAL

Laws, statutes, regulations as interpreted for agriculture, fisheries, or forestry.

Includes but not limited to

- Animal quarantine regulations.
- Breeders' rights.
- Customs regulations.
- Environmental laws and regulations.
- Import and export regulations.
- Legislative aspects of quality control: inspection, supervision, labelling, sanitary regulations.
- Registration of and patents for plant varieties, animal breeds.

Excludes

- Law as written in code books.

LIBRARY SCIENCE

PERIPHERAL

In order for an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to
- Agricultural databases.
- Agricultural/rural libraries.
- Agricultural/rural library organizations (e.g., International Association of Agricultural Librarians and Documentalists).

MICROORGANISMS, INCLUDING BACTERIA, VIRUSES CORE

Selected on the basis of their relation to agricultural, fishery, or forestry subjects.

Includes but not limited to

- Pathogens of plants, insects, or livestock.
- Use of bacteria, viruses, and microorganisms in biological control of insects, weeds, or disease.
- Symbiotic bacteria of plants.
- Soil microbiology.
- Rumen microorganisms.
- Bacterial and viral contaminants of food or feed.
- Bacteria used in processing foods or other agricultural products.
- Bacteria as food or feed (single-cell protein).
- Bacteria as affected by pesticides or pollution from agricultural, fishery, or forestry sources.

Excludes

- Articles on taxonomy, physiology, morphology, and genetics of bacteria except for pathogens of plants, insects, or livestock.
- Photosynthetic bacteria, if article is only on bacterial physiology.
- Production of antibiotics and other drugs by bacteria.

In general publications, microorganisms are included only if they are related to agriculture, fisheries, or forestry and that fact is clearly stated.

NATURAL HISTORY

RELATED

Natural history journals cover a variety of topics. For an article to be considered in scope there must be a direct relationship with agriculture, fisheries, or forestry.

Includes but not limited to

Ecology of plants and insects.

Plant communities.

NUTRITION (HUMAN)

CORE

Attitudes (food habits, fads, customs) of man in relation to foods and feeding are in scope, individually and as they relate to populations.

Articles on human nutrition are in scope for the Indexing Branch portion of the AGRICOLA database if they are not from journals designated in the List of Journals Indexed file as being the exclusive province of the Food and Nutrition Information Center. FNIC maintains its own selection criteria for articles processed by that group for its own AGRICOLA subfile.

Includes but not limited to

- Diet and nutritional disorders of laboratory animals when the animal serves as a model for human application.
- Institutional preparation of food only as it affects nutritional value or contamination.
- Requirements, metabolism, and utilization of nutrients in the diet in health and disease.
- Research involving laboratory animals as models for human application.

Excludes

- Food service management and equipment (unless it affects nutritive value or contamination of food). Food service management and equipment is covered by the Food and Nutrition Information Center.

Exceptions to the "Excludes" list would be publications issued as USDA, State Experiment Station, or State Cooperative Extension Service series, or as determined by NAL policy. See also Human Ecology.

PARASITOLOGY (ANIMAL) CORE

See VETERINARY MEDICINE.

PHYSICAL GEOGRAPHY

PERIPHERAL

For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited tc

Agricultural use of land masses.
Drainage if it affects cultivation or plant/animal/soil relationships.
Ocean currents if they affect food fish, agricultural production and this point is brought out.
Rural communities.
Vegetation of an area.

PHYSICS PERIPHERAL

General physics journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to
Nuclear magnetic resonance for agricultural studies.
Remote sensing for tracking forestry conditions.

PHYSIOLOGY RELATED

General physiology journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Agriculturally significant organisms, such as plants, insects, food animals (including fishes), laboratory animals, metabolism of nutrients in man.

PLANT PRODUCTION CORE

Literature on both plant cultivation and plant sciences is taken as these subject areas are of vital interest to agriculture.

I. Cultivation/growing of field, horticultural, and miscellaneous plants from propagation through harvesting for the production of food, feed, forage, fiber, including ornamentals and medicinal plants.

Includes but not limited to
- General crop husbandry.
- Propagation: grafting, budding, transplanting, sowing, etc.
- Seed production: harvesting, cleaning, storage, cultivation, seed trials.
- Care of plants: pruning, crown thinning, planting, cultivation under cover, etc.
- Control of plant growth: acceleration, forcing, retardation, inhibition, artificial promotion of flowering by chemical means, etc.
- Yields.
- Harvesting and handling of crops.
- Pasture and range management; grazing (as it relates to land areas, grasses, etc.). (Effects of feeding on livestock are indexed under Animal Production.)
- Hydroponics.

II. Application/utilization of multi-disciplinary sciences, such as breeding, ecology, cytology, nutrition, physiology, biochemistry, taxonomy, geography, etc., for improving and increasing the quality/yields of both wild and domestic plants.

Includes but not limited to
- Plant breeding: strains and cultivars.
- Plant collection, selection, germplasm banks.
- Genetics, genetic evaluation, cytogenetics, variation.
- Breeding methods, techniques, and programs.
- Crossbreeding, hybridization, induced mutation.
- Anatomy, cytology, histology, morphology, physiology, biochemistry.
- Taxonomy: mechanisms underlying speciation and related processes, plant geography, floras, cytotaxonomy, chemotaxonomy, nomenclature.
- Wood structure.
- Paleobotany, fossil pollen.
- Checklists of plants.
- Associations, history, education.
- Introduction of plants.
- Arboretums, herbariums, botanical gardens.
- Notable trees.
- Ethnobotany.
- Botanical explorations.

Yeasts

Includes but not limited to

Yeasts as disease organisms (except human diseases).

Yeasts grown for food/feed, used in the production of food/feed (e.g., take fermentation yeasts such as Saccharomyces cerevisiae when used in baking or brewing but not when used as an experimental medium), or other agricultural applications.

Yeasts as part of paleobotany.

Yeasts may be taken when the study is made on the physiology, genetics, cytology, etc., of fungi or plants in general.

Excludes

Yeasts used solely as growing media (when the condition being studied is not natural to the organism).

PLANT PROTECTION CORE

Protection of terrestrial and aquatic plants, forest trees (and their products) from diseases, pests, weeds, and miscellaneous injuries.

Includes but not limited to

- Diseases caused by fungi, bacteria (including mycoplasmas), viruses and viroids; biology of pathogenic organisms.
- Physiological diseases and deficiency diseases.
- Insects, mites, and other arthropod pests directly injurious to plants or serving as vectors of plant pathogens; biology of insect pests.
- Nematodes injurious to plants or acting as vectors of plant pathogens; nematode biology.
- Animals (other than insects and nematodes) injurious to plants.
- Weeds and parasitic higher plants; occurrence, distribution, and biology of weeds; competition with economic crops.
- Injuries caused by atmospheric factors, fire, equipment, pollutants, pesticides, and other physical or non-biogenic agents.
- Prevention and control of diseases and pests by natural, chemical, cultural, biological, or integrated methods.
- Plant protection materials, equipment, methods and programs for disease and pest control in general.
- Immunity, resistance to disease infection, pests and pest resistance to pesticides.
- Breeding plants for resistance to diseases and pests.
- Disease and pest surveys.
- Plant quarantine regulations (this is considered Law).

POLLUTION

RELATED

Contamination of clean surface or ground water, air, or land areas with harmful material. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Pollution from urban or industrial sources as it relates to degradation of agriculture, fishery, or forestry environments.

Wildlife in relation to its being affected by pesticides or pollution from agricultural sources.

PUBLIC HEALTH

RELATED

Protection and improvement of community health when there is a direct relation with agriculture, fisheries, or forestry.

Includes but not limited to

Direct or indirect contact with toxic levels of pesticides by humans.
Food contamination.
Health problems related to agricultural, fisheries, or forestry occupations or work and their community support systems.
Meat inspection.
Pollution in its many forms.
Toxic effects on food plants and animals.
Zoonoses.

RURAL SOCIOLOGY CORE

Sociology and sociography of rural populations and institutions.

Includes but not limited to

- Rural organizations and movements, leadership, farmer political power.
- Rural health, welfare conditions, institutions, and services.
- Rural community institutions/services and their policies, programs, planning.
- Rural-urban relations.
- Population migration to urban areas and from urban areas to rural areas.
- Social aspects of migratory and contract labor, sharecroppers, etc.
- Standard of living.
- Rural industries and businesses, farming and other rural businesses.
- Impact of cultural, technological, and political changes and movements on rural life.
- Public utilities for rural areas; e.g., sanitary systems, water supply systems, transportation systems.
- Demography, social stratification.

SOIL SCIENCE CORE

Soil as a natural body and as an economic resource.

Includes but not limited to

- Physics, biology, microbiology.
- Chemistry and mineralogy: leaching, soil testing, hydrogen-ion concentrations, chemical composition, analysis, experimental techniques and evaluation.
- Mechanics and structure: structural condition and stability, porosity, compaction, degradation of pesticides.
- Engineering.
- Classification and genesis.
- Surveying and mapping.
- Soil improvement materials, including commercial fertilizers, manures, industrial waste disposal on farm land, soil conditioners.
- Fertility: depletion, exhaustion, toxicity, salinity, desalination.
- Fertilizer industry: technology, statistics, prices, trade.
- Resources and management, including tillage, harrowing, no-tillage, rolling, plowing, mulching, fallowing; crop rotation, intercropping, catch cropping, dry farming, cultivation under irrigation.
- Erosion and land reclamation.
- Soil sterilization.

STATE COOPERATIVE EXTENSION SERVICE PUBLICATIONS

CORE

Most State Cooperative Extension Service publications in a numbered series or signed chapters in State Cooperative Extension Service-authored monographs are considered in scope by virtue of their relationship to USDA programs and funding.

Selection, scope, and coverage criteria applicable to State Cooperative Extension Service publications do not necessarily follow those criteria used for routinely indexed journals.

Beginning in 19 5, NAL began comprehensive coverage of State Cooperative Extension Service publications.

STATE EXPERIMENT STATION PUBLICATIONS

CORE

Most State Experiment Station publications in a numbered series or signed chapters in State Experiment Station-authored monographs are considered in scope by virtue of their relationship to USDA programs and funding.

Selection, scope, and coverage criteria applicable to State Experiment Station publications do not necessarily follow those criteria used for routinely indexed journals.

Beginning in 1985, NAL began comprehensive coverage of State Experiment Station publications.

TRANSPORTATION

PERIPHERAL

General transportation journals cover a variety to topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Marketing of food/feed, other agricultural, fishery, or forestry products.
Movement of livestock.
Travel in rural areas.

USDA PUBLICATIONS

CORE

Most USDA publications in a numbered series or signed chapters in USDA-authored monographs are considered in scope by virtue of their relationship to USDA programs and funding.

Selection, scope, and coverage criteria applicable to USDA publications do not necessarily follow those criteria used for routinely indexed journals.

VETERINARY MEDICINE CORE

Veterinary medicine in general, as a profession, societies, education, organizations, and services.

Includes but not limited to

- Abnormal behavior (e.g., cannibalism, tail biting, cribbing, feather picking, windsucking, weaving).
- Allergies.
- Anaesthesia.
- Animal health care programs for the farm.
- Animals as vectors of diseases.
- Castration.
- Deficiency diseases.
- Dehorning.
- Diagnostic techniques.
- Fractures, sprains.
- General animal health problems and quarantine.
- Infectious, parasitic (see note below), and non-infectious diseases of animals and the biology of disease-causing organisms.
- Legislative aspects of animal disease, meat inspection, quarantine (this is considered Law).
- Meat inspection.
- Miscellaneous injuries caused by physical agents (including radiation), non-biogenic, non-chemical injuries and their prevention.
- Surgery.
- Veterinary laboratory methods and equipment.
- Veterinary pharmacology, toxicology, and therapeutic methods.
- Veterinary public health.
- Zoonoses.

Excludes

- Comparative medicine.
- Experimental surgery
- Human/animal bond.
- Human parasitology (except for zoonoses and diseases in which animals serve as vectors).
- Primatology.

Parasitology

Parasitology is an exception to the rule of selecting only articles that pertain to agriculture, fisheries, and forestry.

With this subject any animal parasites are indexed, provided they are natural to the animal under discussion; i.e., the animal does not merely serve as a model for human disease study. This expanded criterion is used only by the Indexing Branch. COOPERATORS SHOULD CONTINUE TO INDEX ONLY THOSE ARTICLES WITH DIRECT APPLICATION TO DOMESTIC ANIMALS.

VETERINARY MEDICINE (continued) CORE

Laboratory Animals

Includes articles dealing with the care, handling, and management of laboratory animals/colonies, excluding primates, and their indigenous diseases of interest to veterinarians and agricultural research institutes.

Articles merely written by veterinarians or agricultural research institutes are not necessarily in scope; the subject matter must be considered appropriate.

Excludes

Induced diseases of laboratory animals or other experimentation with them unless of interest to veterinary medicine or as related to agriculture, fisheries, or forestry.

The indexer is reminded that laboratory animals are often used as models for human diseases and disorders.

BACKGROUND

The National Agricultural Library (NAL) and the National Library of Medicine (NLM) completed an agreement (1985) regarding joint responsibilities for the provision of access to veterinary science literature.

Together, the two National Libraries attempt to collect, retain, and preserve all significant information on veterinary science.

The general division of national level collection responsibilities was defined as follows:

NAL - veterinary anatomy, anesthesiology, biochemistry, clinical pathology, dermatology, embryology, histology, immunology, internal medicine, microbiology, parasitology, pathology, pharmacology, physiology, radiology, surgery, toxicology, animal nutrition (physiologic aspects), invertebrate pathology, theriogenology.

NAL - comparative medicine, experimental surgery, human/animal bond, primatology.

NAL and NLM - laboratory animal medicine and technology, veterinary profession, radiobiology, public health.

WEATHER/CLIMATE

PERIPHERAL

Articles on weather/climate are taken if they treat weather/climate as it affects agriculture, fisheries, or forestry; e.g., agriculture in general, physiology of crops, culture of crops, animal production, construction of animal housing.

WILDLIFE

RELATED

To be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

Includes but not limited to

Competititon for food resources with livestock and economic plants.
Reservoirs of disease for livestock and economic plants.
Wildlife if it is the desired target of pesticides used to increase agricultural, fishery, or forestry production.
Wildlife if it is the inadvertent target of toxic levels of pesticides used for agriculture, fisheries, or forestry.
Wildlife if it is the unintentional recipient of toxic levels of pollution.
Wildlife management as it relates to disease, pollution, pesticides.

See PLANT PRODUCTION.

General zoology journals cover a variety of topics. For an article to be considered in scope there must be a direct relation to agriculture, fisheries, or forestry.

NON-SELECTION CRITERIA FOR ROUTINELY-INDEXED JOURNALS

OMIT based on:

TIME

1. Publication date (serial and monographic) from industrialized nations should be no more than two years old. (USSR is considered industrialized.)

2. Publication date (serial and monographic) from developing nations should be no more than five years old.

3. Exceptions may be made for important conferences, symposia, etc.

4. Statistical publications covering less than one year, unless the statistics are cumulated on a shorter basis only.

LENGTH

1. Non-scientific articles less than one page. (Articles on insect or plant taxonomy and nomenclature are taken regardless of length. New cultivar and germplasm registrations are taken without restriction on length.)

2. Notice of awards given to agricultural scientists if less than one-half page.

3. Biographies or obituaries of agricultural scientists if less than one-half page.

4. Monographs-in-series with 30 or more pages. These are cataloged. (See also, number 5, below.) <u>This policy is currently under revision</u>.

5. Any monographs-in-series, of any length, indexed by cooperative indexing institutions/contractors.

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TREATMENT

1. Personal experiences, unless an original device or method is used.

2. Most popular articles on amateur gardening, home processing of foods, bee keeping, poultry or rabbit raising, and similar material unless written by USDA, State Experiment Station, or State Cooperative Extension Service personnel.

3. Reports of meeting, symposia, or conferences that do not contain full texts of papers.

4. Success stories of local personalities/enterprises using non-scientifically controlled methods of production.

FORM

1. Courses of study.

2. Show catalogs.

3. Forms (unless part of an extension or similar series).

4. Newspaper articles.

5. Prize papers below the master's level.

6. Student publications.

7. Restricted use publications (unless restriction has expired at time of input).

8. Articles signed with pseudonyms.

9. Articles with date lines, news reports from cities, and similar items.

10. Editorials, unless by USDA personnel or of clear agricultural, fishery, or forestry importance with distinguishing title.

11. Interviews, unless in unusual cases; e.g., USDA Agency Head or higher, prominent agricultural scientist.

12. Monthly hints type of article.

13. Presidential addresses without unique title, unless by USDA program/project personnel or of clear agricultural, fishery, or forestry importance.

14. Regularly featured columns, without distinguishing title that treats specific topic.

15. Translations presented as typed manuscripts, where the vernacular version appears under separate cover. This type of translation is cataloged.

16. Unsigned articles except when of clear agricultural, fishery, or forestry importance.

17. Abstracts are not indexed, unless considered part of a Special Project.

18. Reprints, unless they are items in a USDA, State Experiment Station, or State Cooperative Extension Service publication. Reprints in other publications are omitted regardless of whether or not NAL receives the referenced publication.

    USDA-authored reprints/preprints, that appear as separate items, are considered Special Projects.

19. Letters to the editor, except those in scientific journals which are at least one page in length and have a distinguishing title.

20. Microforms, except for microfiche of papers presented at meetings of the American Society of Agricultural Engineers. This criterion is subject to change depending upon trends in the publishing world and NAL policy.

21. Music, except for songs, music composed for Woodsy Owl, Smokey the Bear, and other USDA characters printed in USDA numbered series or in signed chapters appearing in monographic publications.

22. Oral histories.

23. Monographs indexed by cooperating institutions.

24. Dissertations, theses.

ANNEX D

NAL/OICD EXPANDED TRANSLATIONS PROGRAM

Information Alert

United States Department of Agriculture

From The National Agricultural Library

EXPANDED TRANSLATIONS PROGRAM ANNOUNCED BY NAL, OICD

Translations of foreign-language publications on agricultural science and technology will be more broadly available to U.S. Department of Agriculture (USDA) personnel and other agricultural researchers and extension workers nationwide under a new agreement between the National Agricultural Library (NAL) and the Office of International Cooperation and Development (OICD).

In a joint announcement Joseph H Howard, NAL Director, and Dr. Joan S. Wallace, Administrator of OICD, said that Special Foreign Currencies (SFC) as authorized under Public Law 480 will be used to pay for overseas translation of journal articles, monographs, reports, etc. The memorandum of understanding between the two agencies continues a program previously underway, extending the scope of translations and shifting additional responsibility to the library.

"The NAL is prepared to accept requests for translations of materials on agricultural-related topics from researchers in the USDA, land-grant institutions and agricultural colleges, and from Extension," Howard said. Dr. Wallace stated that OICD has arranged for translations to be made from publications in the following languages: Arabic, Bulgarian, Dutch, French, German, Italian, Japanese, Portuguese, Rumanian, Russian, and Spanish. A limited capability is available in Afrikaans, Chinese, Czech, Hungarian, Polish, Thai, Turkish, and Ukrainian; and other languages may become available in the future.

USDA personnel should forward requests to NAL through channels, as specified by their agency. Others may send them directly to the Translation Liaison, Public Services Division, NAL. Requests should be accompanied by three copies of the publication to be translated. If a copy of the original is not readily available, the Library staff will work with the requester to obtain copies, at his expense if more than nominal costs are involved. The NAL will refer copies of the original item to be translated, with a bibliographic citation, to translators under contract to OICD.

According to Dr. Wallace, the OICD has contracted with several organizations overseas to provide translations in as timely a manner as possible depending on the nature and length of the item to be translated. OICD will pay for the work in foreign currencies and provide copies to the original requester as well as to NAL and other interested institutions. Land-grant libraries will receive automatically translations of all materials in subject categories they have selected.

Translations will be tracked from initial request to completion by a computerized system maintained by the NAL. The Library will add copies of the translation to its collection, promptly enter a bibliographic citation for it into AGRICOLA, its online database, and provide copies upon demand, as it does for other materials in its collection.

"This agreement," Howard said, "will enhance the access of the researcher to a significant body of foreign agricultural literature previously inaccessible because of language barriers."

November 13, 1984

June 3, 1985

Dr. Larry Laird
Directorate of Food and Agricultural
S and T/FA
USAID
Washington, D.C. 20523

Dear Dr. Laird:

The Translations Program Staff of the National Agricultural Library is pleased to extend its services to the USAID. We are prepared to accept requests for translations of materials on agriculturally related topics in the following languages: Afrikaans, Arabic, Bulgarian, Chinese, Czech, Dutch, French, German, Hungarian, Italian, Japanese, Polish, Portuguese, Rumanian, Russian, Spanish, Thai, Turkish, and Ukrainian. Other languages may become available in the future. Material submitted may come from journal articles or monographs, although, at present, we are able to handle only one to two monographs per language per month.

When submitting material for translation, we ask, please that the requester include three clear copies of the material and a complete bibliographic citation for each item. The citation should include the author(s), title of the article or book in the original language or romanized, title of the journal in the original language or romanized publisher of the book, volume and issue numbers, year of publication and the pagination. The requester's return address should also be included. The turnaround time for journal articles is six to eight months from the time the material reaches the contractor. For monographs, the translation and editing will take approximately ten to twelve months and an additional ten months for printing the hard copies.

If you have any questions concerning the program, please contact me on (301) 344-1639. We greatly appreciate your interest and look forward to receiving material from you in the future.

Sincerely,

MICHAEL E. THOMPSON
Translation Liaison
Room 1402, Public Services

cc:
K. W. Russell, NAL
H. Dewey, AID Update

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