

AFRICAN RURAL ECONOMY PROGRAM

WORKING PAPER

ACCESS TO SOURCES OF INFORMATION ON
AGRICULTURAL DEVELOPMENT IN THE SAHEL

by
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ACCESS TO SOURCES OF INFORMATION ON
AGRICULTURAL DEVELOPMENT IN THE SAHEL*

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FOREWORD

The African Rural Economy Program was established in 1976 as an activity of Michigan State University's Department of Agricultural Economics. The African Rural Economy Program is a successor to the African Rural Employment Research Network which functioned over the 1971-1976 period.

The primary mission of the African Rural Economy Program is to further comparative analysis of the development process in Africa with emphasis on both micro and macro level research on the rural economy. The research program is carried out by faculty and students in the Department of Agricultural Economics in cooperation with researchers in African universities and government agencies. Specific examples of ongoing research are, "Poor Rural Households, Income Distribution and Technical Change in Sierra Leone, Ethiopia and Ghana," "Rural and Urban Small-Scale Industry in West Africa," "Dynamics of Female Participation in the Economic Development Process in West Africa," and "The Economics of Small Farmer Production and Marketing Systems in the Sahelian Zone of West Africa."

Carl K. Eicher
Professor of Agricultural Economics
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PREFACE

For the last six or seven years, there has been a growing interest in American governmental and academic circles in the drought and associated problems of the Sahel region of Africa. In fact, several new research programs and special offices have been created around the country with the purpose of providing assistance to the disaster stricken countries of the Sahel. The U.S. Agency for International Development (A.I.D.) established a special office concerned with the Sahel area. Institutions of higher learning and consortia such as the Consortium for International Development (C.I.D.) have begun to focus increased attention on the lamentable situation in the Sahel. Their work programs now concentrate on training, consulting and field research activities.

Most of these endeavors also maintain close relationship with a number of other foreign agencies and their work is coordinated with such programs as that of the Comité Permanent Interétats de Lutte contre la Secheresse dans le Sahel (C.I.L.S.S.) in Ouagadougou, Upper Volta, and with other similar efforts in Africa and Europe.

At Michigan State University, a Sahel Documentation Center (S.D.C.) was established in September 1976 under an Agency for International Development grant (AID/afr-C-1261). The S.D.C. now serves as a resource base for M.S.U.'s program of work in the Sahel--which includes consulting services for the A.I.D. and its field offices in the Sahel, applied research in agricultural economics and Master's degree level training for Sahelian students. The S.D.C. also serves as a comprehensive and up-to-date professional information bank on the Sahel region for the A.I.D. and other donor agency personnel, consulting firms and for students of Sahel development.

In carrying out its mandate, the S.D.C. will strive to achieve a large intake of published and unpublished documents on the Sahel from around the world with emphasis on socio-economic development, including agricultural planning and development, agricultural marketing, small-scale industry, fisheries and livestock, human resource development (education, health, migration, etc.), food storage, transfer of technology, price policy and other activities of major consequence so identified "...by the Working Group of the Club des Amis du Sahel as essential to planning for the long-term development of the Sahel region" (from the A.I.D. grant document).

The author of this Working Paper, Mrs. Gretchen Walsh, who is the librarian/documentalist in charge of the Sahel Documentation Center, has had several years of field experience in West Africa and is well conversant in the scientific documentation process and in information storage and retrieval.

Eugene de Benko
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ACCESS TO SOURCES OF INFORMATION ON AGRICULTURAL
DEVELOPMENT IN THE SAHEL

Without entering into the controversial questions of who should make recommendations for development in Africa and how this development would best be achieved, this paper will address itself to an investigation of the basic need of all who undertake research for development: information. The information needed by development researchers and planners is varied. It includes basic raw data, such as population statistics, soil chemistry analyses, climatic data, crop yields, farm size, etc.; research reports from individuals and organizations working in the same or related fields or geographic area; results of basic research, whether or not directly related to the area of concentration; and background knowledge which allows the development planner to tailor recommendations to the particular social, cultural and economic reality.

These information needs apply to African planners as well as to non-African advisors and to policy makers as well as to technicians and researchers. No matter what kind of information is needed, there are two steps in its acquisition: awareness and delivery. The problems inherent in each of these steps and the approaches to their solution affect equally the individual researchers and library or information center.

No one needs to be reminded that published information has proliferated in recent years. New journals appear almost daily. Researchers in industry and academia alike are urged to publish as a means to promotion. Reports are made of studies and research projects--progress reports, interim reports and final reports. Many of these are published in house organs, presented at conferences and distributed in the proceedings of meetings. Researchers, at least in this country and to a certain extent in the developing nations as well, subscribe routinely to a number of professional journals and peruse others on a regular basis in their local

or university libraries. They keep themselves up to date with current developments in their field through correspondence with colleagues. This correspondence is largely what researchers believe in and rely upon. It was striking that in a panel discussion of information needs for researchers in developing countries held at a workshop on information networking, graduate students from South America, Africa and East Asia repeatedly suggested a newsletter that would keep them informed of the work and progress of colleagues around the world when they returned to their home countries to take up research posts.

Development, however, tends to be a multi-disciplinary field; and researchers often must depend on other, less personal, means of canvassing the literature. For those interested in the Sahel, this canvassing can present additional problems. During the early 1970s when the African drought was "news", many research, humanitarian, and educational organizations undertook programs of varying scale and purpose in response to immediate and long-range problems in the Sahel. In many cases there has been an abundance of good will and a dearth of communication, so that similar--in some cases nearly identical--projects are undertaken. Thus, effort is duplicated; energy, time and money wasted; and the people of the Sahel do not benefit as greatly as they might if all this effort and good will were efficiently recorded and coordinated.

Looking at the problem of awareness, first from the point of view of a library or information center in this country, there are a number of standard sources that can be consulted with some degree of success. One of the newest--and thus most fun--is on-line searching of computerized bibliographic data bases. These are generally computer tape versions of abstracting and indexing services whose printed versions have been

standard tools for many years. There are some immediately apparent disadvantages in these on-line services. The major complaint is that most of them have files that only go back a few years. BIOSIS, the tape version of Biological Abstracts, covering biology, zoology, plant sciences, etc., covers 1972 to date; AGRICOLA, formerly called CAIN, the tape version of the National Agriculture Library's Bibliography of Agriculture, covers 1970 to date. A definite advantage is the speed and ease with which a computer can scan thousands of files and generate a list of entries dealing with a combination of search terms. "The effects of rock phosphate fertilization on sorghum in West Africa" is an example of a search profile combining several terms which could be difficult to search manually in the printed indexes. The usefulness of these services is limited, however, by the coverage of African and specifically Sahelian material indexed. There are also pitfalls to be encountered in drawing up a search profile, as the sample searches in Appendix I will illustrate.

The sample searches were conducted using either Lockheed or Systems Development Corporation commercial access to the data bases of Social Science Citation Index, National Technical Information Service, Biological Abstracts, AGRICOLA, and ERIC. The terms used were West Africa, West African, Sahel-, Tchad-, Chad-, Senegal-, Mauritania-, Mali-, Sudan-, Ethiopia-, Haute Volta-, Upper Volta-, and Niger-. A symbol following a word allowed for expansion of the term, for example, Senegalese, Sahelian. Occasionally this caused trouble. From previous experience it had been observed that niger- often picked up articles on the organism aspergillus niger, so a NOT logic instruction was fed in to eliminate these items. Niger- also picked up Nigeria, Nigerian, etc., so no additional term was needed to cover that area. Another pitfall is africa- picking up African

violets on some data bases. Specifying West and spelling out both Africa and African avoided this. Except for the one NOT instruction, all terms were combined with OR logic. Any title containing any of the search terms was picked up. Data bases vary as to their searchable fields. Some will search on title only; some will search on the entire citation, including the abstract and for some a predetermined subject terminology must be used. As each term is entered as a query, the computer responds with the number of citations on file containing that term. As things turned out, although care was taken to avoid false citations, the expansion of Mali- turned up Malibu and malignant. The number of citations given for that term are therefore suspect.

By and large, these services turn up a surprising amount of material on the Sahel, often from unexpected sources. The data bases do not give complete coverage of all possible sources, but can act, where available, as a useful selection tool for recent material. The printed versions of the data bases do not provide easy access by geographic terms, however. Off-line computer searches on these abstracting and indexing services are also available, at a savings over the equipment and other costs of on-line searching. They can usually be contracted as a current awareness service, with periodic printouts of searches on the weekly or monthly tapes, with special requests if retrospective searching is desired. Computerized Information Services at the University of California, Los Angeles, offers monthly or bimonthly current awareness updates on several data bases, including Biological Abstracts, Chemical Abstracts and AGRICOLA. Other centers throughout the country offer similar services. ASCA is the computerized service of Current Contents, put out by the Institute for Scientific Information. This weekly service turns up several cita-

tions on the geographic terms in the search profile as a result of its coverage of some 5,000 journals, both U.S. and foreign. The Smithsonian Scientific Information Exchange offers a valuable access to current research projects. The information given is an outline of the project, not bibliographic citations. SSIE's geographic coverage, however, is somewhat limited to U.S.-based research projects, except for the input from FAO's CARIS a few years ago. AID, in its bulletin Aid Research and Development Abstracts, supplies access to AID grant and contract and report publications. These cover all AID programs, but reflect AID's recent emphasis on the Sahel.

Several European indexing and abstracting services are of use in surveying current literature on the Sahel. They are computerized, but only CAB is available for on-line searching in this country at present. The abstracting services of the Commonwealth Agricultural Bureaux offer very good African coverage. The printed journals appear monthly and cover such topics as field crops, entomology, dairy science, soils and fertilizers, weeds, agricultural economics and rural sociology. The citations are arranged by general topic with numerous sub-headings. They are not indexed by country or geographic area, however, which makes them tedious to search for Sahelian citations. From time to time subject sections will be reprinted in bibliographies, arranged in geographic areas. The Bulletin Signaletique, published monthly by the Centre National de la Recherche Scientifique of France, covers a wide range of sciences, fifty sections in all. The Bulletin Signaletique is published from tapes produced on the PASCAL system. These cover research on Africa, particularly Francophone Africa. However, like the CAB abstracts, they are difficult to search for geographic terms. Although not an abstracting service per

se, the Institut de Recherches Agronomiques Tropicales began in 1973 to publish a yearly bibliography of IRAT publications with abstracts in English. This appears as a supplement to Agronomie Tropicale and offers one of the richest sources of agricultural material on the Sahel. While many of the citations are journal articles, a majority of which appeared in Agronomie Tropicale, many are research reports which are not published for distribution. An added advantage to this yearly listing is that copies of all material cited are available from IRAT in Paris. They can also make available publications and reports from the various IRAT stations in Africa.

A major recent indexing service is AGRINDEX, the product of FAO's AGRIS. This is an attempt to bring bibliographic control to agricultural literature produced the world over. Centers in each country supply input to the computing center in Vienna. A monthly bibliographic bulletin is published and the tapes are available to contributing nations and institutions. The National Agriculture Library may at some time offer online access to these tapes through AGRICOLA although at the moment the computer programs are incompatible. The citations in the bulletin are arranged by broad subject category. There is no manual access by geographic area or country name.

Awareness has always been a particularly difficult problem in regard to African publications. Announcement, indexing and abstracting services have not kept pace with publications in African nations and government publications and reports from research organizations are especially poorly represented. Major efforts are currently underway in Africa, particularly in West Africa, to improve information services. These are, naturally, aimed at ameliorating the situation of African researchers and develop-

ment planners, but they can be of incalculable help to libraries and information centers in the U.S. and elsewhere as well. With UN funding and assistance, two information centers, serving respectively the Senegal River Basin Commission and the Niger River Basin Commission, have been set up in Saint Louis, Senegal, and Niamey, Niger. These centers are equipped to supply micro- and photo-copies of material listed in their bibliographies. The bibliographies are produced for distribution from computer tapes and are indexed by a title keyword system. This is not always convenient to use in the printed version, but does offer access to material by geographic area as well as by subject.

National bibliographies are not to be overlooked as awareness tools for African publications dealing with agriculture. Senegal is presently the only Sahelian nation regularly producing a national bibliography for distribution, although information is a concern of other national governments. The national bibliographies of other neighboring countries are also useful, especially those of Nigeria and Ghana. The African Book Publishing Record and the cumulation African Books in Print contribute to closing the information gap in agricultural sciences in the Sahel, although their agricultural coverage is not so great as coverage of other subjects. Ghana has recently initiated, through its Council for Scientific and Industrial Research, a serial publication, Ghana Science Abstracts, which promises to be very useful for the scientific community in West Africa and to serve as a model for other similar publications.

Research centers in West Africa which deal with Sahelian agricultural problems have increased their information services in recent years. For the most part, these services tend to consist of lists of center publications, sometimes combined with citations of publications in other

media by staff members. The libraries, documentation, publication or information centers attached to these research stations are often also very helpful in supplying addresses, clarifying incomplete citations and rendering other bibliographic assistance. This can be particularly useful in tracking down proceedings of conferences and in tracing unpublished or in-house material.

A list with addresses of selected research stations and centers in West Africa appears in Appendix II. Two such centers in Nigeria are the International Institute for Tropical Agriculture in Ibadan and the Institute for Agricultural Research at Samaru, Zaria. A center in Upper Volta which has broadened its scope in recent projects is the Comité Interafricain d'Etudes Hydrauliques in Ouagadougou. With AID funding and in conjunction with the U.S. Consultants TAMS Agricultural Development Group, CIEH is developing a Documentation Center in addition to its research and educational activities. This center covers material in the disciplines of agricultural land use, range management, forestry and demography, as well as the disciplines more usually associated with its name, such as hydrology, hydrogeology, meteorology, etc. This center produces a quarterly Liaison Bulletin with bibliographies. Documents are coded with geographic terms and are thus accessible on this basis. CIEH plans to make microfiche copies of the documents available. Another center in Ouagadougou is the Societe Africaine d'Etude et Developpement. This is a non-governmental consulting firm which plans a documentation center of material relating to agricultural and economic development.* The Comite Permanent Interetats de Lutte contre la Secheresse dans le Sahel (CILSS) also plans to set up a Documentation Center along with a training center in Bamako, called the Institut du Sahel. The CILSS headquarters are in Ouagadougou, Upper Volta.

*Volunteers in Technical Assistance (VITA) are now working with SAED to develop an information center for appropriate technology.

Useful non-bibliographic information often requested by researchers is that concerning current research in their fields. This is especially important for coordination of research and the elimination of wasteful duplication. CODESRIA, headquartered in Dakar, plans a data bank of research in progress. CARIS, an FAO project, did publish a directory of agricultural research in West Africa in 1973. Funding problems have stalled CARIS for the time being. Its original output has been incorporated into SSIE. UNISIST, working with African development planners and the Committee on Engineering Information of the World Federation of Engineering Organizations, recommended in 1975 that CASTAFRICA, a central data bank for technical information, be established in Africa. This central data bank, with appropriate subregional branches, would collect information locally and would also disseminate information, using the major international data bases, to African research centers.

Monographic bibliographies on special topics are useful as selection and awareness tools. However, their drawbacks are well known. They are rigid and quickly outdated; revising a published document is costly and time-consuming; and annotated bibliographies, while especially useful to the reader, add even more to the cost and time of revision. The format of some bibliographies is enough to cause screams of frustration from librarians who are attempting to acquire some of the material listed. Standard formats approved by some scholarly societies often given the place of publication, but not the publisher. Abbreviations and acronyms are often left a mysterious and unintelligible garble. Leaving aside the citations which are simply wrong--mistyped, misspelled, etc.--bibliographies could be vastly more useful if the library location of out-of-print items were noted and if sources were suggested for unpublished material.

Appendix III notes briefly some of the more irritating as well as the more helpful examples.

Several U.S. universities have undertaken research projects on various aspects of the drought and development in the Sahel and other parts of Africa. These projects have bibliographic and documentation adjuncts which are widely useful because they pull together not only Sahelian material but basic research applicable to specific problems. The University of California, Riverside, has developed a computerized bibliographic data base to support research for an AID 211(d) grant, "Moisture Utilization in the Semi-Arid Tropics: Summer Rainfall Agriculture," (MUSAT:sra). This data base, currently holding over seven thousand entries, is indexed by author, title, geographic area and subject. Bibliographies on special topics can be generated upon request. Northwestern University undertook a massive drought documentation project in conjunction with research projects on adaptation to ecostress in East and West Africa. Clark University has begun research projects under the general title, "The Least Developed Nations: Development Approaches for the Environmentally Constrained". An area of concentration in this broad topic is the Sahel. MIT produced the AID funded report, "A Framework for Agricultural Development Planning," which is available through ARDA. Michigan State University is initiating a Sahelian Documentation Center, which will support its research and development programs in the Sahel and will produce a quarterly bibliographic bulletin. All of these institutions offer possible sources of acquisitions information, as well as possibilities for interlibrary loans.

In addition to university projects, other agencies have done work in the Sahel in recent years. The National Academy of Sciences did a

study which resulted in the publications: Arid Lands of Sub-Saharan Africa: Staff Progress Report, September 1973 - June 1974; Staff Final Report, July 1974 - December 1974; and Appendices to the Staff Final Report. The Rockefeller Foundation published a report in its Working Papers series, Conference on International Development: Strategies for the Sahel. Both of these reports deal in part with the Bellagio meeting in October 1974. The Overseas Liaison Committee of the American Council on Education has undertaken projects on the Sahel. Its Paper No. 8, The Sahelian Drought and Its Demographic Implications by John C. Caldwell, is available in French and English from OLC. The Rural Development Network Bulletin, No. 5, March 1976, is entirely devoted to a discussion of the recovery of the Sahel with a list of publications and bibliographies.

For a time, the International Congress of African Studies, Research Liaison Committee on Drought and Famine in Africa, published a newsletter edited by Peter Mitchell at the Centre of West African Studies, University of Birmingham. The newsletter does not seem to have survived past 1975. Some of its function has been taken over by the journal produced jointly by the International African Institute and the Environment Training Program of IDEP in Dakar, African Environment. Volume 1, No. 2, April 1975 is devoted to the Sahelian drought. Another group in England is the Disaster Research Unit of Bradford University which produced as their Occasional Paper No. 8, African Drought--A Review by Philip O'Keefe. The School of Oriental and African Studies conducted a symposium in 1973 which resulted in the published report, Drought in Africa.

In France, the Groupement d'Etudes et de Recherches pour le Developpement de l'Agronomie Tropicale (GERDAT) is the central organization of which IRAT, mentioned earlier, is a part. There are nine member groups

which conduct research and produce publications on tropical agriculture. Of these, several deal mostly with the Sahel: Centre Technique Forestier Tropical, Institut d'Elevage et de Medecine Veterinaire des pays Tropicaux and Institut de Recherches pour les Huiles et Oleagineux. All have information services and are usually quite helpful in providing publications. A booklet prepared by GERDAT, entitled, quite simply, GERDAT, describes these member organizations, their research goals and their publications. Another French organization which has produced a great deal of research on the Sahel, including soil and geological maps is the Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM). They also publish ethnographic studies. The Comite Information Sahel has produced Qui se nourrit de la famine en Afrique and was formed originally as an informal clearinghouse of information and ideas. Two UN offices, the FAO Office of Sahelian Relief Organizations and the United Nations Sahelian Office, have produced a good deal of documentation on the Sahel and the drought. The United Nations Sahelian Office published the Sahelian Newsletter until January of 1975 and continues to be active in drought control research as well as in long-term development in the Sahel.

Problems of acquisitions cannot really be separated from problems of awareness. Presumably what one doesn't know about is not a source of frustration, but inability to serve the information needs of one's clientele and inability to complete a collection in a given area. These matters are frustrating, indeed.

The May 1976 issue of Africana Libraries Newsletter carries an evaluation of African Imprints Library Services, a firm based in Bedford, New York, which has proven very helpful in obtaining Sahelian materials.

AILS works very well with a detailed desiderata profile and the Sahelian countries seem to have excellent agents who are responsive to special requests. They have a better supply of CILSS documents than CILSS itself has been able to provide in most cases and recently have begun to supply research station publications in quantity.

Ministries are not the most receptive nor the most responsive of agencies to work with in obtaining publications. Statistical information has always been a strong point of Ministry publications, along with development plans and associated documents. Very often the research centers and stations themselves are better sources for publications on nationally funded research. The chances are always better when dealing with a research center that one will make contact with a librarian or researcher who has genuine interest in the topics under study, who wants publications to be disseminated and who will initiate and follow through on exchange agreements. The centers mentioned earlier and listed in Appendix II have exhibited a good deal of helpfulness in this regard, to the point of sending photocopies of out-of-print or unpublished materials, often on the strength of unspecified promised exchanges.

OMVS and the Niger River Basin Commission both have duplication facilities and promise to supply microfiche copies of everything in their indexes. CIEH in Ouagadougou hopes to develop such delivery capability in the near future. West Africa, and the Sahel in particular, has been the focus of AID attention and funding in the past few years; and this interest promises to continue. Information service has been part of the package of programs and contracts dealing with this area and studies have been underway for AID support of agricultural information networks in West Africa. In projections from these studies, IITA in Nigeria and OMVS in Senegal

emerge as the leaders in such a network. AGRIS Level Two, or AGRIS TROPICAL, the stage of AGRIS which concentrates on networks of information centers and libraries dealing with specialized topics, is also focusing on West Africa. This is probably due to a combination of interest in the Sahel because of the drought and the initiative and energy exhibited by West African librarians and information specialists. OMVS has assumed regional responsibility for input into AGRINDEX. The Bureau Inter africain des Sols in Bangui, Central African Republic, will probably assume responsibility for soil science input for AGRIS TROPICAL. This networking concept will ideally include participation of such international research organizations such as ILCA (International Livestock Center for Africa, Addis Ababa), ICRISAT (International Crops Research Institute for the Semi-Arid Tropics, Hyderabad, India, with regional projects underway in Senegal), WARDA (West African Rice Development Association, Monrovia) and others. Even those organizations with geographic emphases far afield from West Africa and the Sahel may well have useful information for research there.

The difficulties of obtaining research pertinent to agricultural development in the Sahel are multiplied when they apply to the needs of African researchers and development planners. Problems of funding often preclude the acquisition of a wide range of materials, forcing a stringent selectivity, often without providing the tools for selection. This problem has received the attention of information specialists in the developed nations and a number of programs have been undertaken to solve it.

AID's quarterly ARDA list has a wide, free circulation and microfiche copies of the publications themselves are available free in limited quantities to institutions in developing countries. U.S. institutions can

order copies through NTIS. A wider range of assistance is offered by the Development Reference Service. Formerly part of the Organization for Economic Cooperation and Development, DRS is now affiliated with the Society for International Development. It acts as a referral point, copying and disseminating requests for various kinds of information to institutions likely to be able to supply assistance. This assistance can be in the form of bibliographies, documents or actual consultative advice. The activities of OMVS and other similar institutions are also aimed at providing wide, inexpensive dissemination of materials to libraries and information centers in West Africa.

There is no panacea for the information ills of the Sahel, neither for those U.S. libraries with interest in the area, nor for libraries in the Sahel itself. There is, however, a great deal of activity and enthusiasm in the field of information services for and about the Sahel and we may be approaching the solutions to these problems from many varied roads.

APPENDIX I
ILLUSTRATION OF COMPUTER LITERATURE SEARCHES

SOC SCISEARCH (Social Science Citation Index)

*West Africa	191	SAMPLE ENTRY:
West African	106	
Sahel-	19	Integration process between Gambia and Senegal (SP)
Tchad-	5	Marinasotero L: Revista de Politica Internacional,
Chad-	50	V 1976, N144, p. 273-282, 1976.
Senegal-	132	
Mauritania-	8	
Mali-	197	ALL SETS, combined with OR: 1891 entries.
Sudan-	145	
Ethiopia-	207	
Haute Volta-	2	
Upper Volta-	17	
Niger- (-asp.)	871	

NTIS (National Technical Information Service)

West Africa	39	SAMPLE ENTRY:
West African	5	
Sahel-	5	Specific ozone destruction rate and flux over bushy
Tchad-	1	steppes from ozone and temperature profiles deter-
Chad-	22	mined on a 120 M Mast in Tsumeb/South West Africa.
Senegal-	28	Max Planck Institut fuer Agronomie. Author:
Mauritania-	10	Wilbrandt, P.J., 1975. Rept. no.: REPT-54/
Mali-	786	1975, ISBN-3-540-0737-6.
Sudan	27	
Ethiopia-	94	(This entry shows that South West Africa is pulled
Upper Volta-	14	in by the query "West Africa". Other entries
Haute Volta-	0	in this search yielded "Malibu" for Mali-.)
Niger- (-asp.)	103	

NTIS contains abstracts with the citations.

ALL SETS, combined with OR: 1077 entries.

*The numbers in the column to the right of the search terms indicate the number of citations in the data base containing that term, e.g., West Africa occurs in 191 citations. The term Niger- was entered as Niger+NOT aspergillus to eliminate citations to articles on the organism niger aspergillus. This is shown as Niger- (asp.). The search indicated the total number of citations when all terms were combined by OR logic, i.e., West Africa OR West African OR Sahel-, etc. This total is given as ALL SETS, combined with OR: _____.

BIOSIS (Biological Abstracts)

West Africa	446	SAMPLE ENTRY:
West African	145	
Sahel-	31	The significance of crop residues to the maintenance of fertility under continuous cultivation at Samaru, Nigeria. Jones, M.J., J. Agric. Sci. 86 (1). 1976. 117-125.
Tchad-	2	
Chad-	142	
Senegal-	345	
Mauritania-	73	
Mali-	6316	(The profile for this data base needs attention because of the number of organisms which are pulled in by the terms, as well as <u>malignant</u> for mali-. The number of entries is highly suspect, but valuable material can turn up on this data base.)
Sudan-	595	
Ethiopia-	510	
Upper Volta	53	
Niger- (-asp.)	1534	

ALL SETS, combined with OR: 10,179.

CAIN (now called AGRICOLA. National Agriculture Library)

West Africa	278	SAMPLE ENTRY:
West African	130	
Sahel-	56	QK938.P7F7
Tchad-	86	An illustrated guide to the grasses of Ethiopia. By Bengt Froman and Sven Persson. Chilalo Agricultural Development Unit, Asella, Ethiopia. 540 p. Ill. 1974.
Chad-	126	
Senegal-	264	
Mauritania-	28	
Mali-	546	
Sudan-	499	ALL SETS, combined with OR: 3401.
Ethiopia-	354	
Upper Volta-	50	
Haute Volta-	39	
Niger- (asp.)	1179	

ERIC (Educational Resources Information Center)

West Africa	76	SAMPLE ENTRY:
West African	45	
Sahel-	3	A pilot study of Nigerian pupils' attitude toward and achievement in a programmed unit of geography. Okunrotifa, P.O. Journal of Negro Education; 44; 4; 538-546. F. 75.
Niger-	325	
Tchad-	2	
Chad-	21	
Mauritania-	2	
Mali-	76	ALL SETS, combined with OR: 619.
Sudan-	39	
Ethiopia-	93	
Upper Volta-	8	
Haute Volta-	1	
Niger- (-asp.)	324	

APPENDIX II
ADDRESSES OF ORGANIZATIONS CITED

Data Bases Used in Sample Searches

<p>BIOSIS BioSciences Information Service 2110 Arch Street Philadelphia, PA 19103 U.S.A.</p> <p>CAIN (AGRICOLA) National Agriculture Library Beltsville, MD 20705 U.S.A.</p> <p>ERIC U.S. Department of Health, Education and Welfare National Institute of Education Educational Resources Information Center Washington, D.C. 20202 U.S.A.</p>	<p>NTIS National Technical Information Service U.S. Department of Commerce Springfield, VA 22151 U.S.A.</p> <p>SOC SCISEARCH Institute for Scientific Informa- tion 325 Chestnut Street Philadelphia, PA 19106 U.S.A.</p>
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Other Data Bases and Information Services

<p>African Book Publishing Record African Books in Print Mansell Information/Publishing 3, Bloomsbury Place London WC1A 20A, England (U.S. Distributor: International Scholarly Books Services P.O. Box 4347 Portland, OR 97208 U.S.A.)</p> <p>African Imprints Library Ser- vices Guard Hill Road Bedford, NY 10506 U.S.A.</p> <p>AGRIS AGRIS TROPICAL Food and Agriculture Organization Via delle Terme di Caracalla Rome 00100, Italy</p>	<p>ASCA (Automated Subject Citation Alert) Institute for Scientific Information 325 Chestnut Street Philadelphia, PA 19106 U.S.A.</p> <p>AID Research and Development Ab- stracts (ARDA) AID Reference Center and Technical Assistance Bureau Agency for International Development Washington, D.C. 20523 U.S.A.</p> <p>CARIS Food and Agriculture Organization Via delle Terme di Caracalla Rome 00100, Italy</p> <p>Centre National de la Recherche Scientifique (CNRS) Centre de Documentation 15, quai Anatole France 75 Paris 7e, France</p>
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Other Data Bases and Information Services - Continued

Commonwealth Agriculture Bureaux (CAB) Farnham House Farnham Royal Slough SL2 3BN, England	Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres (IRAT) 110, rue de l'Universite Paris 7e, France
Computerized Information Services 32 Powell Library Building University of California Los Angeles, CA 90024	Smithsonian Scientific Information Exchange (SSIE) Room 300 1730 M Street, N.W. Washington, D.C. 20036 U.S.A.
Council for the Development of Economic and Social Research in Africa (CODESRIA) B.P. 3186 Dakar, Senegal	UNISIST CASTAFRICA UNESCO Division of Scientific and Technical Information and Documentation 7 Place de Fontenoy 75700 Paris, France

Research Centers in Africa

Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar (ASECNA) P. Malekou, Director General B.P. 3144 Dakar, Senegal (Climatological Data)	Centre National de Recherches Agronomiques (CNRA) B.P. 41 Bambey, Senegal
Bureau Inter africain des Sols B.P. 1362 Bangui, Central African Republic	Comite Permanent Interetats de Lutte Contre la Secheresse dans le Sahel (CILSS) Aly Cisse, Executive Secretary B.P. 7049 Ouagadougou, Upper Volta
Centre de Documentation pour le Programme de Developpement du Bassin du Fleuve Senegal (OMVS) Djiby Sall, Directeur B.P. 383 Saint-Louis, Senegal	Council for Scientific and Indus- trial Research (CSIR) P.O. Box m.32 Accra, Ghana
Centre Inter africain d'Etudes Hydrauliques (CIEH) B.P. 369 Ouagadougou, Upper Volta	Documentation Center of the River Niger Commission B.P. 933 Niamey, Niger
	Institut Panafricain pour le Developpement B.P. 4078 Douala, Cameroon

Research Centers in Africa - Continued

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Institute for Agricultural Research (SAMARU) P.M.B. 1044 Zaria, Nigeria	National Council for Research P.O. Box 2404 Khartoum, Sudan
International Institute of Trop- ical Agriculture (IITA) P.M.B. 5320 Ibadan, Nigeria	West Africa Rice Development Association (WARDA) P.O. Box 1019 Monrovia, Liberia

Other Research Centers and Sahelian Projects

Center for Policy Alternatives Massachusetts Institute of Tech- nology Cambridge, MA 02139 U.S.A.	Groupement d'Etudes et de Recherches pour le Developpement de l'Agronomie Tropicale (GERDAT) 5, Square Petrarque Paris 16e, France
Comite Information Sahel 8, rue Louis Thuillier 75005 Paris, France	International African Institute 210 High Holborn London WC1V 7BW, England
Development Reference Service, Society for International Devel- opment (DRS/SID) 49, rue de la Glaciere 75013 Paris, France	International Congress of African Studies, Research Liaison Committee on Drought and Famine in Africa c/o Peter Mitchell Centre of West African Studies University of Birmingham P.O. Box 363 Birmingham B15 2TT, England
Disaster Research Unit University of Bradford Bradford, Yorkshire BD7 1DP England	International Crops Research Insti- tute for the Semi-Arid Tropics (ICRISAT) 1-11-256 Begumpet Hyderabad-500016, A.P., India
Drought Documentation Project Melville J. Herskovits Library of African Studies Northwestern University Evanston, IL 60201 U.S.A.	Institute for Economic Development and Planning (IDEP) B.P. 3370 Dakar, Senegal
Food and Agriculture Organization Office of Sahelian Relief Opera- tions Via delle Terme di Caracalla Rome 00100, Italy	

Other Research Centers and Sahelian Centers - Continued

Moisture Utilization in Semi-Arid
Tropics: Summer Rainfall
Agriculture Project
(MUSAT: sra Project)

Science Libraries
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Riverside, CA 92507 U.S.A.

National Academy of Sciences (NAS)
2101 Constitution Avenue
Washington, D.C. 20418 U.S.A.

Office de la Recherche Scienti-
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Mer (ORSTOM)

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24, rue Bayard
75008, Paris, France

Service Central de Documentation
70-74 Route d'Aulnay
93140 Bondy, France

Organization for Economic Coop-
eration and Development
(OECD)

94, rue Chardon-Lagache
75016 Paris, France

Overseas Liaison Committee
American Council on Education
11 Dupont Circle
Washington, D.C. 20036 U.S.A.

Research Group on the Least Devel-
oped Nations
Clark University
Worcester, MA 01610 U.S.A.

Sahelian Documentation Center
International Library
Michigan State University
East Lansing, MI 48824 U.S.A.

School of Oriental and African
Studies
Malet Street
London WC1E 7HP, England

U.N. Sahelian Office
United Nations
866 United Nations Plaza
New York, NY 10017 U.S.A.

APPENDIX III
BIBLIOGRAPHIES

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