INFORMATION NEEDS OF AGRICULTURAL SCIENTISTS : PROBLEMS AND PROSPECTS

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The paper evaluates how far the existing information systems can meet the research, education and extension needs in Agricultural Sector in India. It points out the wrong concepts about information systems and services, puts forward suggestions for improvement and recommends the establishement of a central agency to monitor the utilisation of resources allotted for agricultural information services.

0 Introduction

Information ranks next to the basic human needs; air, water, food and shelter. Its collections, transfer and use are all pervasive and universal activities. Information needs of individual researchers and research and educational institutions in agricultural sector where information is an essential ingredient for development, had not so far been the subject of serious discussion in India. This paper attempts to examine the aspect and offers suggestions for ameliorating the present state of affairs. The study is based on a limited understanding gained from our working in an agricultural university for a very short period of time.

Researchers in agricultural and biological sciences are interested not only in analysing information and data on ecological and biological changes related experiments but also in economic and demographic processes at micro and macro levels. No change, be it environmental technological or any other, results from one single factor, but from interaction among several variables. For instance an increase in rice production in a particular area could mainly be the result of the use of a high yielding variety of seed. However, there may exist a large number of other factors which may not be identified at the first instance. They may include the optimum use of fertilisers, timely application of pesticides, watering, general climatic conditions, improved types of implements used for the preparation of soil, weeding, harvesting and also other processes. Indirectly, factors like tenurial relationships, educational level of cultivators, impact of propaganda about new seeds, fertilisers, technology and other factors on cultivators, price level of inputs and outputs etc., might have also influenced the increase in production. As such, all research in agricultural sector to be meaningful would require a variety of information techniques, statistical as well as other, for analysis. This implies that the researcher requires a complex of information to carry on his assignments satisfactorily. The pace of his enquiry would necessarily have to be slowed down on account of non-availability of relevant information required by him. The library and information systems are primarily called upon to provide all available information at the right time so that the work of their clientele should not suffer.

1 Need for Information

The regular users of an agricultural university library and information services which is taken as the sample environment for this study consists broadly the following six groups:

- Heads of research divisions managing university's research projects financed by various sources. They also do independent research, and guide research work;
- Research associates engaged in teaching and research in association with heads of research divisions;
- Officers and scientists of agricultural department of government and other reserch institutes engaged in agricultural research, education and extension;
- Doctoral fellows working for their Ph. D;

- Post graduate and under graduate students of the constituent colleges of the university;
- Teachers working in the university.

2 Use of Information

Most of the user groups specified above use information for analytical studies and preparation of schemes and projects for the state, national and international organizations and for the state and central development plans. Doctoral fellows and students being immediately interested in their term and dissertation assigments, use data for such specific purposes. Teachers use library for updating their information and also for improving their professional competence.

Type of information and data required by the users of an agricultural library and information system varies largely by the types of users and their horizon of activity. Research experiments, their applications, and information and statistical data both at the micro and macro levels relating to agricultural development are in demand. Apart from scientific reports, information bulletins from research institutions, records of experiments conducted, patents, standards, dissertations, etc., are also frequently sought by agricultural scientists. One connot forecast all types of information that would be required for the completion of a specific study.

3 Sources of Information

When comparatively analysed with the developed countries, agricultural information systems in India are not well organised or developed with the right concept. Information is collected by research institutions under state and central goverments and autonomous institutions which include 46 ICAR Institutes, 28 Agricultural Universities, four national Bureaus, 29 National Research Centre, 80 All-India Co-ordinated Reserch Projects (AICRP), 206 Krishi Vigyan Kendras (KVKS), eight Trainers Training Centres (TTCs), etc. But the pooling and sharing of information is not well coordinated or effective.

Various information systems provide services on subject areas of agriculture, biosciences and related areas. There are also various information service networks like BTIS, ERNET, NICNET, INFLIBNET, GISTNIC, ARIS, and others which connect many agricultural research libraries. At international level there are many information systems and databases that specialise in agriculture like ISNAR, COGNET, AGRIBUSINESS, AGRICOLA, AGRIS, CAB and the like, which can be tapped to meet the requirements of our institutions specialising in agricultural research, education and extension, if their library and information system are automated and connected to required networks.

But, the present trend in information networks that support education and research in India is the establishment of computer and communication networks independently from systems which store information. So, the information networks gets degraded to something which is meant for e-mail, statistical information processing, collection and storage of data generated at various stages of research or unplanned wanderings through free and general entertaining databases.

The possibilities offered by current information technology has recently created a misconception among educational and research managers. (Collection and storage of information required for research in a subject field like agriculture which is highly location and climatic specific can never be done merely using computers and electronic mediums). For another half a decade at least traditional mediums will dominate.

ICAR has recently initiated the project, Agricultural Research Information System (ARIS), to enable the pooling and sharing of information generated in State and Central Agricultural Universities and ICAR institutes, to access and disseminate agricultural information to our scientists from worldwide sources and to bring information technology culture to our scientific community serving the agricultural sector.

The major activity planned by ICAR under this project is the modernization of libraries in Agricul-

tural Universities and other agricultural reserch institutions. The libraries are the stores of information recorded in traditional and electronic mediums and are envisaged by ARIS as the central hub of information services in all research and development institutions. An approximate 50% of the estimated cost of ARIS, i. e., 500 million rupees, will be utilised for automation of libraries, their networking and also developing information stores in electronic mediums at these libraries.

4 Collection and Storage

For research in agricultural economic, cooperation, rural development, banking, it would be essential to study or re-examine the evidence for making new interpretations or to establish different relationships for which printed sources of information are not available and manuscripts or unpublished records may be the only resource. Correspondence files in government departments, business firms, banks, and research institutions contian unpublished information of immense value to the researcher in agricultural economics.

Information in agriculture, biosciencs and related areas contained in publications issued by government and various organizations are not easy to locate and procure. As large numbers of both priced and unpriced publications are released by various agencies in quick succession, the libraries find it difficult to keep track of them. Information on such publications do not reach the user or the libraries in time. Librarians and information service professionals have to be alert and constantly hunting for them. Most of such publications go out of sales within months of their release or sales, either sold out, as only a limited number of copies are printed or weeded out from sales list as slow moving publications. In such cases, if fortunate, the library may sometimes tumble upon a copy at some source accidentally. Publications issued by Government and most of the institutions are marked with least commercial interest and competence.

Another group of publications is the unpriced ones printed for limited circulation. Being unpriced, they are not available for purchase, but may be obtained from the agency which sponsored the publication. in the absence of personal influence and contacts, attempts for collecting them do not succeed. Numerous highly informative materials are prepared in mimeographed form by research institutions for limited circulation. Information about their availability is very difficult to obtain and getting copies of such publications will be very difficult.

During the period between generation of knowledge and its eventual publication, the information generated is normally kept confidenital and is as such out of reach of ordinary researchers. It is difficult to locate the source of such unpublished documents. Various research institutions other than the officially designated agencies work on subjects of their interests and choice. The results of such research may or may not be analysed and published and widely circulated. It is now practically impossible to get hold of the vast quantity of such information. Here again, repetitive research, wastage of time, money and manpower is the result.

In the absence of radily available recorded information, the researcher has to tap other sources of information. Records available in agriculture related departments, records of reserch institutions, and firms engaged in agribusiness are commonly approached by researchers. As materials available with government departments are not properly indexed or listed the researcher is forced to go through a tedious process to ascertain whether any material of his interest is available or not. In case they are available, numerous problems confront him in his attempt to copy them. Records of labs in research institutions also pose the same problem if the search is on information about unfinished work.

5 Effective Dissemination

The difficulties in dissemination of information already available arise mainly out of the following factors:

- Existence of large volumes of recorded information or large numbers of publications on the same topic;

- Ignorance of the researcher about his precise information requirements;
- Lack of knowledge on information requirements of the researcher;
- The misconception of automated information system as different from Libraries and resultant insufficiency of library.

It may not always be possible for traditional libraries with staff constraints to scan all the available materials for the information, the researcher is looking for. In such cases the only possible alternative is to give general guidance to the stack areas where the researcher may himself locate his requirements.The manual catalogues with cross reference entries or Online Public Access Catalogues (OPAC) would be helpful in this regard. Again providing information as such from any source may be erroneous or misleading. Information on the same subject compiled by different agencies need not be strictly comparable. under the circumstances, it would always be best to leave the choice of selection of data to the researcher himself.

It is possible for the library to undertake the preparation of bibliographies on topics of research. The bibliography may be limited to the holdings of the library only. To locate other materials on line databases like, CAB database, AGRIS, AGLIS, etc., and printed sources like Index to periodicals International, subject bibliographies, current contents, index to proceedings etc., can be used by the researcher with support and assistance of information service professionals. Bibliographies prepared initially may be up-dated or supplements issued periodically, say,once a year.

Once the subject bibliography is prepared and is given to the researcher, further additions to stock can be brought to his notice by SDI service. The library could roughly guess the possible information requirements of the researcher from his "profile" and the specific research problem. This would enable the library to procure such items on a priority basis.

6 Information Base

Even with the availability of information through various networks from electronic libraries a comprehensive and balanced collection of printed materials on subject areas of interest to the university can not be avoided for reasons already explained. Periodical review of the collection should be made by the users and subject experts. For such a review, groups can be formed for each subject area. The groups may consist of users interested in that particular subject area and a member of the professional staff of the library. The group can examine the collections and databases, evaluate the stock and contents, find out gaps or weakness in the collection and recommend their further development. This kind of review will have many advantages.

- review groups would become more familiar and aware of the existing collection.
- gaps in collection, weakness of the databases existing and additions and further development to be made will be brought to the notice of the review group.
- a closer coordination between scientists an library and information professionals would help to improve the working of the library system.The peer review groups are formed and the more actively they function; the better will be the collections and databases.

7 Right Path

The research worker, often, calls upon the library to provide him with the information he requires. As such, the library should be aware of the information needs of its research community. The library can provide the reader with the materials already in stock and try to access and disseminate whatever is available through the national and international networks and databases. But in the absence of tools or lack of information system to locate the availability of data elsewhere, the library can offer no further service to the reader.

Apart from the provision or location of required information for the researcher, the library could

identify the types of data required by its research community and request the data generating agencies for compilation and supply of information on areas of studies where sufficient information is not available. Research libraries specialising in agriculture, biosciences and environment sciences can effectively do this 'liaison work' between the data generating agencies and the research community.

Information system developed with care to the following factors can efficiently cater to the information requirements of researchers in agricultural sciences:

- Duplication in generation and collection of data by different agencies should be avoided;
- Information from various agencies should be made comparable by quality control and standarisation;
- An intensive survey can be undertaken to locate materials, in individual or institutional collections and wherever the custodians are willing to transfer them, the central agency can collect, preserve, index and make them available for researchers. Matarials which the custodian may prefer to keep with him may also be listed and indexed giving location also. Copying such materials to electronic mediums and maintaining such databases at central agency for the use of the scientists would be ideal;
- A central agency like Agricultural Library and Information Commission may be established for monitoring the work;
- Agricultural libraries should properly be manned, well equipped and made service oriented institutions. Facilities for using electronic databases, copying, translation, etc., should be sufficiently available;
- Micro earth stations, Internet connection, and information service packages/softwares should be made available to libraries long before establishment of information systems and networks so that information will be available in electronic mediums to flow through the network;
- All traditional and modern information systems and services in an agricultural research institute or university should be coordinated by an officer with specialization in library and information science.

The term agricultural science is used to include all disciplines of study directly or indirectly related to agriculture or food. All nations trying hard aiming at rapid rate of development may be following their own policy to achieve agricultural development. But the results of such policies could be of interest and may form guidelines for other countries also. Information as such is itself a source of development. So some international level libraries and information systems in the field of agriculture have also to come into existence with support of World Bank, Asian Bank etc., for collection and dissemination of information. With support from such organizations ARIS has been launched in India by ICAR.

8 Specialized Service

An agricultural information system should be clear about its objectives if it is to develop in the right path. An information system collects, stores and disseminates information. The store of information and specialization for the activities of managing and disseminating information are very important. The traditional stores of information are collections of printed, audio, video and microfilm documents. The modern information store consists mainly of electronic documents like information recorded in tapes, disks etc. Of the information sought for by the users in an agricultural research institute in country like India sixty percent will be available only in print. Another twenty percent well be available both in print and electronic mediums. Twenty percent of the information requirement can be met only by accessing databases existing elsewhere. Hence any agricultural information services in a country like India should blend the services with traditional and modern mediums and methods. This requires specialization also.

Even though recently we have started adopting current technologies we have many misconceptions about information services and systems. We consider information services using computer and communication technology as something different from information services hitherto offered by libraries. Now there is belief that information services in various fields of activities can be managed by concerned scientists without the support of library and information professionals. The facilities offered by computer technology has given this wrong notion. This is a repetition of history. In ancient days scientists themselves managed the manuscripts and traditional document collections in their respective areas. They prepared the documents, copied them, preserved them and offered services using them. Invention of printing and the explosion of documents necessitated specialization in information work to save the time of the scientist from the collection, storage and dissemination works. So came the profession of library and information scientists who were also called documentalists in the initial stages. Now, again the new mediums given an illusion that scientists can again manage and control information without much effort and specialisation in information science. It will take some time for us to come out of this myth. What is actually required for information service to be effective is a blending of traditional and modern mediums and techniques carefully planned by library and information specialist in accordance with users need.

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