ROLE OF AN AGRICULTURAL UNIVERSITY LIBRARY IN TECHNOLOGY TRANSFER IN AGRICULTURE

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Indian agricultural universities have made a great contribution in the fields of agricultural education, research and extension and have justified the investment of public funds on them as they have solved the problem of food and hunger to a considerable extent by undertaking the extensive research programmes and adopting modern technology for increasing agricultural production and transforming rural life by way of transfer of technology. In order to sustain and further accelerate their pace of research and development it is necessary to ensure central and state support for sound development of agricultural university libraries which are the treasure houses of information resources. A 'Network of Agriculture Information System' at national, international and regional level should be established in collaboration with agricultural university libraries and I.C.A.R. Institute libraries for effective transfer of technology in agriculture.

1. INTRODUCTION

Agricultural education, research, and extension are three of the essential services that an agricultural university must provide for a country's agricultural development. Research evolves new ideas and new techniques, extension assists farm people to put into practice the products of research and education provides trained personnel for all agricultural development, including research and extension. The three services constitute the framework in which the university effort, including I.C.A.R. technical assistance, can work to benefit the farming community. Whether such effort is utilised in the most effective and economic way depends on the organization and administration of these services, which are closely interrelated.

In India agricultural education is on the threshold of a new era. This new era defines the parameters in which university libraries are to function for the foreseeable future. A very serious concern for those libraries that serve the major research oriented universities is the continuance of their capacities to provide adequate information resources for academic research.

Need for bibliographic control of doctoral and post-doctoral research potential is being felt more and more. As expansion of agricultural education goes forward following economic improvement and as science, technology and trade develop in the same way the quantity of research work also increases every year. Interdisciplinary overlapping has opened up new fields of research. In view of this situation, it is necessary that the researcher knows what has already been done in his field of research. He should know what type of data have already been collected and what theories, based on that data, have been propounded. Transfer of research results from laboratories to fields through library will keep alive the hopes of the nation.

2. OBJECTIVES

Today, the food-producing countries are being asked to share their abundance with the millions of hungry people in the world. Factors vital to the future of the world food supply include the less costly farm machinery, development of indigenous farm machinery for less developed countries, development of alternative sources of energy, increased input into basic research, improvements in more and better high-

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yielding crop strains, more effective land use, a world-wide agricultural meteorological network, and a world food reserve system. These represent only a sample of the many basic challenges facing the world agricultural community.

There is a growing consensus that food may be one of the most complex economic, political, and moral issues of our time. In this regard, agricultural librarians, documentalists, and information specialists have a vital role to play in providing timely and relevant information services to farmers, livestock producers, agricultural business organizations, research workers, subject specialists, teachers, students, and others who are actively engaged in meeting the continuing challenge of man, food and hunger.

I would like to suggest a few critical turning points for agriculture awaiting us in the years ahead. Our capability to increase crop yield is one of our major concerns. We have to get off the plateau that is holding back agricultural production rates. To do that will require integration and use of information in such ways as have not been done before. Secondly, agriculture of the future will have a priority directed towards elimination of contaminants in food products, resulting in new information demand. Thirdly, the genetics of crops and livestock will have vastly increased information needs to produce better crops and animals. Future needs for information will be enormous as we improve and develop new techniques to save and restore our resources. Our immediate task is that we must think of tomorrow. We must work out the technology today for the newly restructured technical information system in science, education and administration to make sure that it meets our needs for the future. All of us in agriculture will be relying as before on computer technology as a vital and crucial aid for information processing that will allow us to connect all those concerned with creative decision making in agriculture. Our objective is to improve our knowledge about the agricultural information and the utilisation thereof. The agricultural university libraries in collaboration with ICAR Institutes should form a network of library and information system under the guidance of Indian Council of Agricultural Research.

3. LIBRARY DEVELOPMENT FOR EFFECTIVE ROLES AND FUNCTIONS

National Education Commission (1964) in its report recommended the establishment of at least one agricultural university in each state of India. National Commission on Agriculture (1976) recommended implementation of various developmental plans for establishing new agricultural complexes, I.C.A.R. Institutes and projects in collaboration with the agricultural universities in India. This has opened avenues for the establishment of modern, well developed and well organised university libraries on scientific basis in order to play a vital constructive role in the nation building task of agricultural education, research and extension. Communication of new information and technology to the agricultural scientists is the main task of university libraries in India. A modern, well-developed and well-equipped university library plays a vital role in the process of information transfer to agricultural scientists.

Recent developments in agriculture and allied sciences have created new pressures on the libraries of the agricultural universities inasmuch as these serve the needs of agricultural education, research and extension education. A university library is a necessary adjunct to the teacher's aid and a researcher's tool without which they cannot make the best use in an effective and efficient manner of their time or talents. A university library, being an integral part of a university must be developed into a dynamic institution where the staff and the students including the research workers would come for the advancement of their skills and for seeking assistance for changing their attitudes in the desired direction. A well-equipped library run by an efficient organisation is in fact the soul of an educational institution. Faculties however well-equipped and manned by competent staff would soon find themselves in a morass of intellectual stagnation, backwardness, if those are not supported by a dynamic, modern, up to date and efficiently managed library. The development of the university library, therefore, has no limits. It is one institution which should continuously grow and should never be allowed to relapse into stagnation.

4. CHANGING NATURE OF AGRICULTURAL LIBRARIANSHIP

There has been a great increase in the academic library use per student because of changes in instructional methods. Formerly, the professor, who often had a rather parochial attitude towards knowledge, depended entirely on prescribed textbooks and lectures. Now, the student is often encouraged to read more widely and to do more independent literature searching. This change, along with greatly accelerated research and a vast increase in literature, has stimulated library use. The
The library has indeed become a vital instrument for education and research. In addition, libraries are being operated more efficiently through the use of scientific management methods. Great improvements in processing techniques and document delivery services have taken place through the adoption of new technologies by modern libraries.

5. TECHNOLOGY TRANSFER, CONCEPT, PROCESSES AND COMPLEXITIES.

Technology transfer connotes the movement of technology from its generation, through its dissemination and appropriate adaptation, to application in a given economic, political, social and cultural context. It also covers the communication of technological information, and the development of indigenous technology.

The transfer of technology is largely an information and communication process. It ranges from detailed documentation to the casual remarks. The achievement of effective transfer calls for special efforts on the part of both the donor and the recipient. This role is realised by the information centres who are seeking ways of shortening the distance between source and user and of making available interpretive services of a quality matched to the level of expertise of the user.

Agricultural university library information services play an important role in the transfer of technology. UNESCO believes that in this new context of technology transfer, the question of promotion of the flow of scientific and technological information assumes greater significance. The motivating factor in the transfer of technology usually is knowledge, falling into right hands. Technical information is a potential source of innovation, and the availability of and access to the latest information, published or otherwise recorded, is clearly vital. Technological information, being the product of technological research, takes the original form of write-ups by scientists and technologists and usually reported in scientific journals. Technology information needed is of three types. Researchers need abstracts of latest researches in the field. Industrialists need information regarding machines, markets, finance and competitiveness of technology. The management and the government need information on technical and financial options that are open, status of competitiveness of indigenous technology in relation to other countries, and its social implications, before a rational choice could be made.

Technology transfer is a very complex area. It is affected by various conditions of the environment. In order to make technology transfer effective and speedy, it is necessary to know the environmental conditions in which the technology has to be transferred, i.e. the local material resources, manpower, capital resources, technological requirements and desired level of development, the various technologies available, the sources from where the technologies can be obtained, the conditions for the import of technologies, their future implications to the recipient society, etc. Another important aspect of technology transfer is the assessment and evaluation of the technologies so that they may suit the environment and achieve the desired results.

The implications of technology transfer in developing countries are as follows:

(a) Policy decisions of the government in respect of the import of technologies, desired level of development, support for labour intensive technologies, etc.

(b) Local capabilities and resources to adopt the technology.

(c) Maintenance of the adopted technology, equipment, etc.

(d) Socio-economic benefits to be accrued from it.

(e) Ecological imbalances to be caused.

(f) Adequacy of information policy and support.

(g) Capability to select, evaluate, negotiate, acquire, adopt, and further develop the technologies.

In view of the above complexities, technology transfer needs a sound information base and information services to enable the policy makers to evolve right policies and to help adaptation, evaluation and application of relevant technologies for development.

6. TECHNOLOGY TRANSFER FOR RURAL SECTOR

Application of scientific and technological advances to development in the rural sector requires conditions and mechanisms different from those needed for development in the industrial sector. The technology for rural development not only includes adoption of new processes and practices in cultivation, but also manufacturing of the capital goods for the whole array of small scale and cottage industries, fisheries, dairying, house construction and so on. This also requires the participation of
greater number of people at the grass-root level requiring not only science and technology information but also socio-economic information.

It has long been recognised that in dealing with rural population the use of individuals either from, or at least thoroughly acquainted with the locality, tends to produce a better response, especially when the contact is supported with practical demonstrations or audio-visual presentations in the language of the community. Regular broadcasts, discussions, demonstrations of and popular lectures prove useful in communicating scientific, technical and other information related to development to rural audience.

The local traditional techniques and practices in the rural areas need also be respected. Information on local traditions helps to relate imported technology and national research programmes to what rural areas need in developing appropriate technology.

In India there is a state communication channel going hand in hand with administrative structure operating at the national level for the transfer of new technology to lower level. Field workers of various development commissions, district officers, block development officers, and specialist extension officers in various fields comprise this channel. These officials in charge of development programmes of the state can be strongly supported with new technical information by creating a liaison with NISSAT and the agricultural library system in the country. Dr. Senor's T & V system also emphasizes the importance of technology transfer to the agricultural development programmes. The transfer of know-how from specialist to farmer is ensured in two stages i.e. training and visit.

Therefore, the agriculture university library system should be developed hand in hand with and linked to NISSAT to facilitate the flow of information down to the grassroot level. The agricultural library system should be further developed and existing libraries improved to ensure that every one has access to a library.

7. THE FUTURE OF INTERNATIONAL COOPERATION IN AGRICULTURAL INFORMATION

International cooperation in the collection, processing, and sharing of scientific and technical information takes many forms and can be accomplished through many agencies. There has been an almost universal recognition that information is both a national and international resource which should be utilised for the socio-economic and technological progress of mankind as a whole. Besides, no nation in the world, not even the most affluent and technologically advanced one, is now in a position to gather and handle effectively all the information generated in the world. This realisation has resulted in growing cooperation in the field. The launching of the UNISIST programme in 1971 by the UNESCO is a milestone in international cooperation in information handling. A number of international information systems and services, sponsored by various United Nations agencies, with the active participation of Member States, have been already established within the conceptual framework of UNISIST e.g. International Nuclear Information System (INIS), International Information System for Agricultural Sciences and Technology (AGRIS), Current Agricultural Research Information System (CARIS), Aquatic Sciences and Fisheries Information System (ASFIS), Global Environmental Monitoring Systems (GEMS), International Register of Potentially Toxic Chemicals (IRPTC), Industrial Information System (INDIS). Several information systems are in the process of being established e.g. Development Sciences Information System (DEVISIS), Science Policy Information Exchange System (SPIRES). These international information systems and services should result in reducing, if not completely eliminating, duplication of information systems and services. These systems are particularly beneficial to developing countries most of which have neither the material resources or technical expertise to have large information systems of their own in various fields. Even developed countries have found them useful. As a result they are slowly discounting such national information systems that are no more needed because of the existence of a comprehensive international information system in the field. For example, the United States discontinued its Nuclear Science Abstracts started in 1948 when INIS Atomindex attained the status of a comprehensive international abstracting periodical in nuclear science and technology, in 1976.

8. SOURCE OF INFORMATION IN INDIAN AGRICULTURE

The most significant landmark in the field of documentation and information in the country is undoubtedly the launching of the National Information System for Science and Technology (NISSAT) by the Department of Science and Technology in May 1977. This unique system acts as a coordinating agency to interlink the existing and future information sources, systems and services in the field of science and technology into an effective national network. Although good progress has been achieved in the building up the system, the pace of its...
evolution into a national information network should be accelerated considering the ever-increasing requirements of the Indian scientific and technical community which is the third largest in the world.

Another significant landmark is the setting up of the National Informatics Centre (NIC) by the Electronics Commission. The Centre aims at providing the hardware and software for maintaining initially the following data bases required by several ministries/departments of the Government, namely, (1) data base on agriculture and environment information (2) data base on manpower information, (3) data base on industry and technology information, (4) data base on financial information. It has been planned to provide several interactive terminals to the user ministries and departments for ready access to the data bases. The NIC services will also be used by NIS SATT through a terminal in the Department of Science and Technology.

9. TRAINING OF PERSONNEL

Personnel in agricultural research libraries will have to be more specialized in technical, agricultural and closely allied sciences, if we wish to provide more sophisticated information and bibliographic services to agricultural scientists. The courses offered by Insdoc and DRTC are quite comprehensive and the calibre of the trainees is generally satisfactory, but their intake should be enhanced to meet the increasing demand of existing and new documentation and information centres. Information technology is still in its infancy in the country. Documentation and information activities are by and large confined mostly to scientific organisations and institutions, national laboratories and some large public sector undertakings and private industrial firms. INSDOC, our national scientific documentation centre established in 1952, though has done excellent work in some areas, has not yet provided dynamic leadership to the country in the field of documentation and information technology.

10. AGRICULTURAL UNIVERSITY LIBRARY SYSTEM

As per the recommendations of the National Education Commission (1964), one agricultural university has been established in each state in our country. Recent emphasis on agricultural development have necessitated opening of more than one agricultural universities in same of the states in India. The main objectives of an agriculture university are: (i) Making provision for imparting education in different branches of knowledge, particularly agriculture, horticulture, veterinary and animal sciences, fisheries, forestry, agricultural engineering, home science and allied branches (ii) Furthering the advancement of learning and prosecution of research, particularly in agriculture and allied sciences (iii) Undertaking extension work of such sciences specially to the rural people of the state; and (iv) such other purposes as the university may determine from time to time.

Taking into consideration the objectives of the agricultural university, the responsibility of the librarian turns out to be the establishment of a university library which will be central library and will cater to the needs of all the staff and students, research scientists, extension workers, specialists, teachers, policy makers and planners.

Some of the agricultural universities in India are multi-campus universities having constituent colleges imparting instructions in graduate and post graduate courses in Agriculture and Veterinary Sciences. In such cases constituent college libraries will have to develop college libraries for achieving the objectives of agricultural education, research and extension. Most of the agricultural universities in India have been established on the pattern of Land Grant Colleges in America and as such state governments have transferred their lands along with all the responsibilities of agricultural research, education and extension education to agricultural universities. As a result of this, the agricultural research stations which were already in existence with the state governments have also been transferred to agricultural universities. In some of the agricultural universities rural institutes have been established as per the recommendations of Dr. Radhakrishnan Commission (13) for imparting training to the farmers. Recently, ICAR has established Krishi Vigyan Kendra under the administrative control of agricultural universities for imparting training to farmers in rural areas. In addition, ICAR has entrusted various operational research projects to the agricultural universities for the upliftment of backward areas. In the agricultural universities in Maharashtra, there are agricultural schools under the faculty of Lower Agricultural Education, which gives training to young boys after completion of their education up to 7th standard.

In an agricultural university, their should be a network of libraries starting from the university library which will serve as the central library for the whole of the agriculture university. Then comes college libraries, research station libraries, K.V.K. libraries,
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O.R.P. libraries and agricultural school libraries. The University librarian as Chief of this library system must collect the literature of various types concerning agricultural education and organise and develop the libraries in such a way that they render efficient and effective information services to clientele.

The various types of information material like bibliographies, abstracts, indexes, reference books, periodicals, annual reports, research papers, directories, yearbooks, encyclopaedias, gazetteers, monographs, maps, atlases, bulletins, annual reviews, and advances should be procured to satisfy the demands of the academic community.

Further, university libraries should start the documentation and reprography services to meet the immediate requirements of research scientists.

11. CONCLUSION

11.1 Communication of new developments in agriculture and related fields to the agricultural scientists is the main task of agricultural universities in India and, therefore, providing adequate information support for academic research is the main concern of agricultural university libraries.

11.2 In order to play a vital and constructive role in the nation building task in agricultural education, research, extension education, and to maintain communication process of information transfer to agricultural scientists, well-organised, well-developed, modern agricultural university libraries should be established by each agricultural university in India.

11.3 Efficient library and information services presuppose well-trained and well-qualified staff. Therefore, inservice training of library staff in documentation should be imparted by agricultural universities.

11.4 Indian Council of Agricultural Research should establish National Agricultural Library and Information System in collaboration with agricultural university libraries, IARI Library and ICAR institute libraries as vital sources of information in the country.

11.5 National responsibilities are coming to agricultural university libraries in India because they have knowledge and expertise and as such a network of libraries and information services should be established by the university librarians wherever there are multicampus agricultural universities with university library working as the central repository library and college libraries, research station libraries, krishi vigyan kendra libraries, operational research project libraries and agricultural school libraries, forming the various nodes of the network to play a vital and constructive role in the process of technology transfer in agriculture.

12. REFERENCES


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