AGRICULTURAL INFORMATION NETWORK IN INDIA

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Trace the historical development of agricultural research institutes and their libraries in India. Surveys the world output of agricultural literature and enumerates the Indian indexing and abstracting services in agricultural sciences. Works out a model for the National agricultural information network.

1 BACKGROUND

Present day agricultural research does not limit itself to the techniques of farming alone; it has broadened its scope to embrace both basic and applied sciences involved with the production of food, and materials for shelter and clothing as well as with the improvement of plants and animals and their protection and conservation. The other related areas are marketing and distribution of agricultural produce and socio-economic problems of farmers. Agricultural sciences mainly include plant sciences, forestry, animal husbandry, fisheries and marine products. With the alarming rate of growth in population, results of agricultural research are being put into widespread use for maximising production. At present over 3000 scientific institutes, universities, colleges and agricultural experiment stations are engaged in R & D work in the field of agriculture in the world [9].

2 AGRICULTURAL RESEARCH AND EDUCATIONAL COMPLEX IN INDIA

Scientific agriculture began to receive attention in India with the establishment of Imperial Department of Agriculture (Calcutta) in 1881 and followed by the emergence of State Departments of Agriculture in Bombay, Madras, Shillong, Allahabad and Nagpur between 1883 and 1895. The Indian Veterinary Research Institute, Iaithnagar with one division at Mukteswar made its modest beginning as Imperial Bacteriology Laboratory at Poona in 1893. However, it was in the beginning of this century that the Government of India recognised the need for the establishment of a sound system and laid the foundation of organized research in India in 1905 by establishing the Agricultural Research Station and the Experimental Farm (Later called the Imperial Institute of Agricultural Research and still later, after independence, the Indian Agricultural Research Institute). Imperial (now Indian) Council of Agricultural Research was established in 1929 as a Registered Society. A number of Central Commodity Committees dealing with research in respect of particular crops were set up between 1921 and 1962 as semi-autonomous bodies and were located in the main growing regions of the crops concerned. Further the Government of India also established under their direct administrative control a number of Research Institutes such as the Central Rice Research Institute, Cuttack (1946), the Forest Research Institute and Colleges, Dehra Dun (1906), the National Dairy Research Institute, Karnal (1922), the Central Potato Research Institute, Simla (1949) etc. [6]. Similarly, the State Governments also set up their own Research Institutes and Experimental Research Farms. There are a number of other research institutions, such as Tea, Coffee and Rubber Boards, Central Food Technological Research Institute, the Botanical and Zoological Surveys of India, conducting research in agriculture or connected subjects. Indian agricultural research was reorganised in 1966 and as a result 33 research institutions are functioning at present under the auspices of the Indian Council of Agricultural Research. There are also 21 agricultural universities and 73 agricultural and 24 veterinary colleges in different states. Various institutes and universities have their sub-stations and farms. Different States have their own directorates in agriculture, extension, marketing and inspection. There is also an International Crops Research Institute for the Semi Arid Tropics at Hyderabad. In addition, the country has huge complexes of the Government of India like Fertilizer Corporation, Food Corporation and National Seed Corporation, etc. There are similar other complexes in private sectors also.
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3 AGRICULTURAL LIBRARIES IN INDIA

The history of agricultural libraries in India is the history of agricultural research and training institutions. The ICAR institute, agricultural universities, agricultural and veterinary colleges, and state departments of agriculture have their own libraries and have collections of varying sizes. Some of these libraries over the years have enlarged their collection, equipment, facilities and services. For example, the libraries of The Indian Agricultural Research Institute, The Indian Veterinary Research Institute and The National Dairy Research Institute are known for their rich collection in their respective areas in agricultural sciences. The Indian Council of Agricultural Research organized two survey teams in 1957 and 1967, to study the library and documentation activities in agricultural libraries. The report of the second survey which was published in 1969 carried valuable recommendations directed toward evolving a national system of agricultural libraries and documentation centres, with the libraries of The Indian Agricultural Research Institute, The Indian Veterinary Research Institute, and the National Dairy Research Institute functioning as national libraries in agriculture, veterinary and dairy science respectively. The report revealed that ICAR libraries have over 620,000 volumes and 9,832 current serials with them. Agricultural Universities in the country have over 780,000 volumes and 11,392 current serials. However, these libraries do not follow any uniform practice in cataloguing and classification. [7]

4 QUANTUM OF AGRICULTURE LITERATURE

The estimates of the world output of agricultural literature vary considerably. Boyle and Buntrock in their study, 'Survey of World Agricultural Documentation Services', mentioned a total of 1,769,000 items as reported in 354 secondary periodicals taken together [3]. However, this figure represents multiple reporting of the same item of information in different secondary services. It has been estimated that over 25,000 books and monographs are published each year in the fields of agricultural sciences [9]. In addition, various agricultural experiment stations, university and research institutes, all over the world publish 900-1000 bulletin series. Scientific reports and theses account for a good deal of literature and their importance is well recognized. The 'World List of Scientific Periodicals' lists about 60,000 titles of which around 15,000 serials are of interest to agricultural scientists. The Directory of Indian Scientific Periodicals brought out by INSDOC in 1976 has reported 308 agricultural periodicals published in India [5]. Various estimates have been made about the annual output of scientific contributions made in periodicals and they range from one to three million articles. Saxena has reported 1,200,000 articles published in 15,000 periodicals published in the field of agricultural sciences [14]. According to Andera, the presently available estimation on the volume of information are on the lower side [1]. Further to the stock of published information must be added unpublished sources of information. According to Soviet estimates, more than 70% of information is unpublished. It is considered that the proportion of unpublished information in the field of agriculture is higher than the published information.

41 Abstracting and Indexing Services in Agricultural Sciences

Traditionally the literature of the sciences is "controlled" through indexes, reference lists arranged in some useful order for current awareness) or abstracting services. Abstracting and indexing services play an important role in bringing information within the reach of its users and they serve as a principal access device to the existing information. Abstracting services, though slower, give more information for a comparatively deeper study. Numerous indexing and abstracting services have sprung up all over the world. They are diverse in scope, uneven in coverage, and national or international in character. Boyle and Buntrock in their survey have categorised 124 indexing (29 computerised) and 230 abstracting (45 computerised) services published from 41 countries and in 21 languages [3]. To reduce the time lag between primary and secondary publications more and more abstracting and indexing services are employing computers to speed up the production of their publications. As a spin-off, important data bases are being built up in a format amenable to Selective Dissemination of Information (SDI) and to eventual rapid retrieval of retrospective data by mechanical searching. The most important international abstracting and indexing services in the field of agriculture in English language at present are: CAB Abstracts of the Commonwealth Agricultural Bureaux, U.K., Bibliography of Agriculture, Bio-Sciences Information Services of Biological Abstracts, Abstracts of the Information Retrieval Ltd., London and AGRINDEX of International Information System for the Agricultural Sciences & Technology (Agris). International services are by no means comprehensive and no country can afford to dispense with their national abstracting and indexing services. John Sherrod, until recently the Director of the U.S. National Agricultural Library, Washington made this frank statement at a meeting of South American Agricultural Librarians held in Buenos Aires in April 1972. "In recent years... it has been painfully clear to us that the magnitude of the information problem in agriculture, as in most areas of knowledge, has grown beyond the capacity of any one institution or country to handle effectively. We find ourselves in the embarrassing position of facing continually rising costs of system operation, while simultaneously handling, substantially smaller portions of the total information output" [15]. This statement is supplemented by a study made by Rajagopalan and others on the coverage of Indian literature in the CAB abstracts. The study revealed that despite all efforts Indian
agricultural literature is being reported only to an extent of 30-40% in CAB abstracts, though India is one of the member countries of the Commonwealth and is one of the financiers of the CAB abstracting service [13]. Similarly in another paper Rajagopalan et al. (1963) made a survey of the extent of inclusion of Indian documents in the field of agriculture, botany, animal husbandry and zoology in Biological Abstracts as compared to its reporting in Bibliography of Scientific Publications of South East Asia. Only 13.9% of the documents were abstracted (in Biological Abstracts) in six to seven months and even after one year 50% of the documents were not abstracted. The study only confirms the need for national abstracting and indexing services [11].

National Abstracting and Indexing Services in Agriculture

At the national level the service has to be more comprehensive of the broad subject areas of interest with a bias towards the research needs of the country as a whole. At the institutional level, this service usually tends to be in the form of local documentation lists compiled basing the periodicals acquired in the library or documentation section. Some of the services emanating from Indian institutes and of interest to agricultural scientist are given in appendix 1.

5 ROLE OF LIBRARIES AND INFORMATION CENTRES IN AGRICULTURE

51 ICAR's Role

Indian Council of Agricultural Research (ICAR) is supervising and developing the library and documentation facilities of agricultural research institutions in the country. In 1969, a plan was worked out to establish a national system of agricultural information with a National Agricultural Library at its centre. The library of the Indian Agricultural Research Institute (IARI), New Delhi, which is one of the oldest and biggest agricultural libraries of the country, might be designated as the National Agricultural Library and a network of agricultural libraries and documentation units may be built together into a coherent agricultural information network in the country. At present the IARI library has a holding of 260,000 volumes and receives about 4800 current serials annually and serves about 150 readers per day. Catalogue of Serials in the IARI Library brought in 1967 contains 5448 entries, which includes current & ceased serials [4]. The number will now be around 6,000. The library is building up Indian Bibliography of Agriculture (Indian Agricultural Reference Media) since 1944. The bibliography contains about 100,000 references and is arranged in two parts: alphabetical part by author, and subject part in classified order according to Universal Decimal Classification Scheme. The subject part also contains added entries. The bibliography is being kept updated through the addition of about 8000 entries per year, prepared by scanning over 700 Indian and foreign periodicals for work done by Indian scientists relating to Indian agriculture.

ICAR has established in 1967 a current research information centre entitled Research Project Unit at its headquarters in Delhi on the model of Current Research Information System (CRIS) of US Department of Agriculture. The Unit is responsible for collection, collation, indexing and dissemination of information pertaining to all on-going agricultural research projects in India. Data pertaining to 7500 research projects involving 12,000 agricultural research workers in the country have been collected. ICAR is participating in the International Information System for the Agricultural Science, and Technology (AGRIS) since May 1975. In the CARIS Project since September 1975, the Research Project Unit of ICAR is regularly sending input data to the AGRIS data base at Vienna. About 200 Indian journals besides the non-conventional types of literature, are scanned for the collection of input data.

Indian veterinary Research Institute libraries at Izatnagar and Mukteswar contain about 100,000 volumes and subscribe, to about 1000 serials in animal husbandry, veterinary and agricultural sciences. At the Mukteswar Branch, a useful information file has been built up during 1905 to 1947. The file contains about 40,000 references on cards which are of immense value to veterinary scientists. National Dairy Research Institute, Karnal, has a valuable collection of about 45,000 bound volumes and subscribes to over 600 journals of interest to dairy scientists in the country.

52 Publications and Information Directorate and other CSIR Libraries

The Publications and Information Directorate (PID) of CSIR has been publishing an encyclopaedia entitled 'Wealth of India'. For this encyclopaedia an information file has been in preparation for over three decades. It has at present over 4,000,000 references which are filed under approx. 5000 subject headings comprising botanical names for plants, common names for animals, minerals and industries. Corresponding files of information (ledgers) have also been built with necessary photocopies, reprints etc. and at present they number about 5000. Currently it is screening 939 periodicals and serials and 450 annual reports besides 20 abstracting periodicals. About 25,000 references are added each year. The Documentation Section of the PID publishes quarterly 'Bulletin of Indian Raw Materials and Their Utilisation' in two series since 1977. Series A deals with Current Literature on Medicinal and Aromatic Plants and Series B deals with Current Literature on Raw Materials other than Medicinal and Aromatic Plants. Over 200 Indian and foreign journals are scanned to choose titles of interest. Abstracts (about 1200 in a year)
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are also given along with these titles. The holdings of the libraries of CSIR laboratories and institutes are partly or wholly suited to the agricultural scientists. A 'Survey of the CSIR libraries', carried out by Rajagopalan and Ramaswami in 1970[42] reveals that the libraries of National Botanical Gardens (NBG), Central Indian Medicinal Plants Organisation (CIMPO), Central Food Technological Research Institute (CFTRI), and some other institutes contain considerable amount of literature of agricultural interest.

53 Directorate of Agricultural Economics & Statistics, N. Delhi

The Directorate is an important organisation which collects, collates and disseminates useful information on agricultural statistics in the country. The information is published in various publications brought out by the organisation. Important subjects covered by the Directorate are: agricultural prices, agricultural wages, commercial crops, estimates of areas and production of principal crops, farm prices, food statistics, etc.

54 Libraries of Surveys of India

A wealth of information and literature is available at the Botanical Survey of India (BSI), Geological Survey of India (GSI) and Zoological Survey of India (ZSI).

55 Other Libraries and Information Centres

In addition to the above institutes and organisations agricultural information is also emanating from Central Ground Water Board (CGWB), Fertiliser Association of India (FAI), National Seed Corporation of India (NSCI), Pesticide Association of India (PAI), Agricultural Machinery Manufacture Association (AMMA), Directorate of Marketing and Inspection, Central Water and Power Commission, Bhabha Atomic Research Commission (BARC), various meteorology departments, etc. [8].

6 NISSAT

The Department of Science and Technology has included a proposal for the development of a National Information System for Science and Technology (NISSAT) in its programme of Science & Technology. It has been envisaged that this programme will lead to interlinking and coordination of a large number of information sources, systems and services into an effective network. This information network will function under an overall coordinating agency with a national information policy for guidance. This will be an important step toward meeting the information needs of, "scientists, engineers, technologists, management personnel and technicians, the government, the industry and business etc. at all levels in all varieties of organisation, projects and missions, efficiently and effectively with a minimum of duplication of efforts". It is also intended to recognize and identify the lacunae in information sources and services and to make effort to fill up these gaps. Another important feature of NISSAT would be the development of internally compatible national standards and guidelines for information handling techniques which will facilitate interchange of information. A sum of Rs. 1.6 crores has been allocated for the development of the NISSAT in the remaining period of the Fifth Plan. The present and the proposed national information centres would constitute the top level of organisation [10].

61 National Network

A network in information field means a systematic organisation of interconnected libraries, documentation and information centres for achieving greater economy and efficiency. Agricultural Information network in India would therefore be a network of participation of three proposed national agricultural libraries namely IARI, IVRI and NDRI, other libraries of the ICAR, Agricultural Universities Libraries, and ICRISAT, and cooperation of libraries of the food, fertilizer and seed corporation, various commissions and surveys, libraries of CSIR complex, Coffee, Tea and Rubber boards etc. Diagram in appendix 2 represents the Agricultural Information Network in India. This network would form one sector of the NISSAT.

7 INTERNATIONAL COOPERATION

The exponential rate of growth of publication and information embodied in these publications has forced not only the developing but even the developed countries of the world to pool their information resources at the international level and the net result is the emergence of International Systems and AGRIS. As already stated in section 51, in the agriculture field, India is participating in AGRIS. FAO has also sponsored AGLINET, a world wide network consisting of a chain of eleven major agricultural libraries in several regions or countries of the world. AGLINET makes scientific and technical literature available through mutual exploitation of agricultural library resources. It also supports and monitors the work of AGRIS and promotes inter-regional co-ordination in the acquisition of serials avoiding duplication.


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**Appendix 1**

Abstracting and Indexing Services of interest to agricultural scientists and emanating from institutes in India

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Title</th>
<th>Sponsor and address</th>
<th>Year of start</th>
<th>Periodicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Advance Abstracts of contributions of Fisheries and Aquatic Sciences in India</td>
<td>Central Marine Fisheries Research Institute, Marine Fisheries P.O., Mandapam Camp, Tamil Nadu.</td>
<td>1967 - 1970</td>
<td>4/12</td>
</tr>
<tr>
<td>2.</td>
<td>Bibliography of Indian Fisheries (Formerly Quarterly Bibliography of Current Indian References on Fisheries)</td>
<td>Central Inland Fisheries Research Institute (ICAR). Barrackpore, 24 Parganas, West Bengal.</td>
<td>1962</td>
<td>4/12</td>
</tr>
<tr>
<td>5.</td>
<td>Bulletin of India Raw Materials and their Utilization (Ser. B Current Literature on Raw Materials other than Medicinal &amp; Aromatic Plants)</td>
<td>Planing and Development Division, Fertilizer Corporation of India, Sindhri, Bihar.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Fertilizer Technology Abstracts</td>
<td></td>
<td>1968</td>
<td>12/12</td>
</tr>
<tr>
<td>8.</td>
<td>Planning and Development Division, Fertilizer Corporation of India, Sindhri, Bihar.</td>
<td></td>
<td>1963</td>
<td>12/12</td>
</tr>
<tr>
<td>9.</td>
<td>Central Food Technological Research Institute, Mysore.</td>
<td></td>
<td>1966</td>
<td>12/12</td>
</tr>
<tr>
<td>10.</td>
<td>Indian National Scientific Documentation Centre, New Delhi-12</td>
<td></td>
<td>1965</td>
<td>12/12</td>
</tr>
<tr>
<td>12.</td>
<td>Central Board of Irrigation &amp; Power, Kasturba Gandhi Marg, New Delhi-1.</td>
<td></td>
<td>1943</td>
<td>6/12</td>
</tr>
<tr>
<td>13.</td>
<td>Publishing and Translation Division, Haryana Agricultural University, Hissar.</td>
<td></td>
<td>1970</td>
<td>4/12</td>
</tr>
</tbody>
</table>
APPENDIX 2
AGRICULTURAL INFORMATION NETWORK