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ICT Applications in Agriculture University Libraries of Western India: A Study

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Abstract: An attempt has been made to study and represent the status of Library automation in Agricultural university libraries in Western India with the help of data collection tool i.e. questionnaire. Develop a model of consortia of E-resources among agricultural university libraries in India. Also given some suggestions to improve the ICT applications in providing better information services to their users with the help of ICT tools.

I. INTRODUCTION

India primarily is an agrarian country and provides livelihood to about three-fourth of the population and contributes half of the national income. The food grain production has reached to 250 million tons in 2011-12 from 50.8 million tons in 1950-51 during the last sixty years [1]. India's agriculture production has been growing at the rate of 3 percent per annum [2]. India is the fourth largest food grain producer country in the world and offer vast potential for future increase in production. The effectiveness of research and development programs depend upon the quality and quantum of work done by its researchers, who, have to be helped by technical, administrative supporting agencies. One of such is Library and Information Centers (LICs) which plays a vital role in information communication and in keeping the scientist abreast with latest development in their field of study. Agricultural University's Research and Development (R & D) in agricultural sectors was encouraged. Various Committees and Commissions viz. University Education Commission chaired by Dr. S. Radhakrishnan (1948), the first Joint Indo-American Team on Agricultural Research and Education under Dr. Ralph R. Shaw and Dr. D. K. Krishna, Librarian of Indian Council of Agricultural Research library (1954), Second Joint Indo-American Team on Agricultural Education, Research and Extension under the chairmanship of Dr. M. S. Randhawa (1959), High Level Agricultural Research Review Team (1963), University Education Commission under the Chairmanship of Dr. D. S. Kothari (1964); National Commission on Agriculture (1970) and National Commission on Farmers under the chairmanship of Dr. M. S. Swaminathan (2007) were constituted to make recommendations for improvement of agricultural research and education.

II. ROLE OF LIBRARIES AND INFORMATION CENTERS

These Committees and Commissions have advocated the Library and Information Centers as a central point to facilitate the scientists and technologists in using the development in the field of agriculture. The prime aim of the LICs is to develop an agricultural society i.e. able to lead a cultured, prosperous life, laying emphasis on certain basic values in the life and adhering to them. Due to the new technologies, tremendous development has been taken up in the services, facilities and avenues of LICs. The library is able to impart knowledge, skills, inculcation of values; and vocation skills. The knowledge and information are vital for all-round human development and libraries that make available knowledge and information are indeed valuable.

The provision of information services through agricultural libraries was made only after the independence. Developing documentation and information services as a necessary activity of the library is recognized by various Committees and Commissions. The role of ICAR for the development of agricultural libraries and information services is commendable. The Standing Advisory Committee of ICAR advises about the matters and parenting to libraries and their services. A central information service has been initiated in the ICAR Headquarters library through its various projects and through Agricultural Research Information Centers (ARIC). These centers provide SDI using CD-ROM from International Information System for the Agricultural Sciences and Technology (AGRIS) database and has brought out Indian National Agricultural Bibliography (1974-84). It is a national importance for AGRIS and Current Agricultural Research Information System (CARIS) projects of Food and Agriculture Organization of the United Nations (FAO) and focal point for South Asian Association for Regional Cooperation (SAARC) and Agricultural Information Centre. The technology laid greater emphasis on the transfer of scientific and technological information. Several organizations and institutions which are engaged in education, research and extension have consumed and generated the information which is applied by researchers, professors and students. The rapid development in Information Technology has

facilitated the emergence of new electronic devices, media and formats. ICT covers any product that stores, retrieves, manipulates, transmits or receives information electronically in a digital form like personal computers, digital television, email, and robots. With this view, the ICT has a great role while delivering Library and Information Services. The computer based services are generally called as Information Services in LIS profession. Therefore, the application of ICT in agricultural research system is increasingly important. E-agriculture is an emerging field focused on enhancement of agricultural as well as rural development through improved information and communication process. "ICAR Vision 2030 Document" [9] narrates key challenges and opportunities in agricultural sector in the next two decades for developing and appropriate strategy and a roadmap to articulate role of the ICAR in shaping the future of the Indian agricultural research for growth, development and equity. Libraries are considered important for providing information to fulfill the aims and objectives of institute. The ICAR is therefore, supporting by providing funds for the establishment of knowledge bank and networks to improve Knowledge Management System (KMS) for the better development of libraries and users. KMS attempt to achieve the objectives such as i) World Class Customer Intimacy and satisfaction ii) Value added customer service iii) Improve decision making; and iv) Solutions. KMS is a broad discipline which promote and integrated approach to the creation, capture, organize, access and use of an enterprises intellectual capital on customer and market, products, services and internal process. In this KMS, ICT is a driving force to achieve the objectives of the KMS.

III. OBJECTIVES OF THE STUDY

The general objective of this study is to assess the use of ICT in agricultural universities in Maharashtra. The specific objectives are:

1. To find out the level of automation, library management software, its modules, related services and constraints of automation in the library.
2. To examine the status of ICT infrastructure in respect of hardware and software, network connectivity use for library services.
3. To find out the various aspects of library and information services offered by the agricultural university libraries while using ICT.
4. To know the training and orientation needs of library staff to cope-up with new technologies, e-resources, problems if any faced in adopting.
5. To develop a conceptual model for library and information networking among agricultural university libraries of western India.

IV. USE AND APPLICATIONS OF ICT IN AGRICULTURAL UNIVERSITY LIBRARIES IN MAHARASHTRA

While implementing the ICT and its applications in the university libraries various and delivers the services to users were: Two sets of questionnaires were designed to achieve the objective of the study. It was perception of librarians in order to study the use of ICT; librarians of all eight universities were selected. The head of the university library / university librarian were considered as they directly use ICT in day to day operation of library system. The data was also supported by using direct interview, observation and field visit method of research. Furthermore, for the analysis the data were collected, verified, scanned, coded, tabulated, and interpreted systematically. The observations out of these interpretations were also made of their proper places as and when required. The response rate of was 8 (100 %) out of 8.

V. OBSERVATIONS

In order to study the use of ICT in the Agricultural Universities in western part of India, all the eight agricultural universities were selected.

1. First Agricultural University in India was established in 1960 at Pantnagar (UP) and latest one was established in 2011 at Bharsar (Uttarakhand). In western India, during the period 1973 to 2003, no agricultural university was established. Although it is expected to have agricultural university in each state, Goa State did not have any Agricultural University.
2. PDKV was having highest collection of 150531 whereas SDAU Library was having lowest collection of 36745.
3. Thirty-eight percent university librarians were managing by ex-cadre or non-professional in library and information science. 25% university libraries were managed by Assistant University Librarians. Sixty three percent university librarians were in the age range of above 55 years. Twenty five percent university librarians are having a postgraduate degree in LIS. Fifty percent university librarians were having 30 years plus of working experience in the library. Whereas 37.5 % professionals were having experience of 20 years plus. 12.5 % professional was having 12 years of experience.
4. The courses offered by the university namely Bachelor of Science, Master of Science and Doctorate in

- Philosophy in the subject of agricultural and allied subjects are being offered in all the universities in the western India. The courses in fisheries discipline were existed in two universities.
5. Digital library and digitization are crucial for disseminating and preserving knowledge. Digital libraries activities are gathering momentum in agricultural university libraries especially in western India. Since most of the university libraries are funded and controlled by the central and state government, the clear cut digitization program and policies needed for infrastructure, standards, metadata, interoperability, multi-lingual databases, training support, co-ordination, copyright and archiving and preservation methods, so that of PhD theses and M.Sc. dissertations can be greatly benefited by researcher.
 6. For the 50 % of the university libraries are very much needed technical support in respect of digitizing entire collection on PhD theses and M.Sc. dissertations for the future use. These technical support means trained computer specialists, hardware and software, sophisticated scanners, printers, digital cameras, high bandwidth connectivity, back-up system to protect data in case of power failure and high performance workstations and like. About 50 % of the agriculture libraries need to support by providing more funds and encourage them to go ahead with digitization program of their core collection for the benefit of users.
 7. While developing Institutional Repository (IR) everyone has to initiate planning and management of digitizing their own collection and make it ready for information retrieval as and when required by their users.

Respondents had communicated their comments on future plan while developing ICT use in library. The respondents from JAU, MPKV, NAU, and PDKV have offered comments as under respectively:

8. While developing future plan on the programme of ICT use and its application, maximize the facilities to their users for the best access to e-resources especially to students and researchers.
9. For the benefit of users single window access point is being developed through digital library portal. The library portal is being designed for the core group of users. This work is in progress.
10. The respondents had vision of entire library collection to be digitized, network facilities to be extended for maximization of use of collection. In order to protect the library collection, RFID system is being implemented at their libraries.
11. The program of special collection such as M.Sc. Dissertations and PhD theses are to be digitized and the work is in progress. This collection would be linked and will be made available to the remote users through websites.
12. Library Advisory Committee was in position in all the eight agricultural university libraries. All the eight agricultural university libraries are having independent and separate library building. All the librarians were satisfied with the present working hours.
13. The electronic gadgets like Compact Disk, Digital Video Disk (DVD), Audio-Video were available in all the university libraries. MPKV library was having highest collections of video cassettes and lowest in SDAU. NAU library was having more collection of audio visuals cassettes but SDAU has low.
14. The PDKV library has subscribed to the Ten International Databases. Seven university libraries were not acquiring these databases. These databases are; CAB Abstracts, AGRIS, AGRICOLA, Biological Abstracts, Biotechnology Abstracts, Agricultural Food Science and Technology Abstracts, Water Resources Abstracts, Agricultural and Natural Resources, Biological and Agricultural Index and Aquatic Sciences.
15. All the University libraries had acquired Commonwealth Agricultural Bureaux (CAB) Abstracts' database using comprehensively for the purpose of teaching, research and extension in the fields of Agricultural Sciences. 31 % user respondents were interested, used and browsed of CAB Abstracts database 'online'. 26 % user respondents were interested, used and browsed AGRIS Database online, 13 % respondents were interested and using CD-ROM and 12 % respondents were interested using the hard copy manually.
16. AGRICOLA database was used by 23 % respondents online followed by 12 % 'CD-ROM'. 'CARIS' database was used by 12 % respondents online and. 'Biological database used by 17 % on line. '
17. 'The Dewey Decimal Classification (DDC) scheme was extensively used in seven agricultural university libraries except AAU library as it was using a Universal Decimal Classification (UDC) to organize their collection. Anglo-American Cataloguing Rules-II (AACR-II) was widely used in all the university libraries. Seven agricultural university libraries were using open access method
18. Eight agricultural university libraries faced acute shortage of human resource. 63% university libraries were managing without library professionals' head. 25% university libraries are executing their services at the Assistant Librarian level. 63 % librarians are lacked in professional computer training and also network related programmes. The existing staff was not sufficient to provide the ICT based services.
19. Workshop, short-term and long-term courses and the mode of training to staff using ICT was much

- lagging behind.
20. The survey significantly highlighted that the MKV library is having maximum total number of library users / respondents as compared to other libraries.
 21. 50 % university libraries do not provide electronic access to their collection, such as Web OPAC, Online journals and online databases.
 22. Two University libraries namely BSKKV and MKV (i.e. 25 % university libraries in western India) had achieved 100% library automation. 50 % of the university libraries had achieved the 75 % and 25 % libraries had achieved 50 % library automation.
 23. 50 % libraries were using and operating the LIBSYS library software in AAU, JAU, NAU and PDKV. 38 % University libraries were using SLIM++ in BSKKV, MKV and MPKV and 12 % University library namely SDAU using TLSS library software.
 24. All the eight university libraries were library software modules. 38 % libraries upgraded and enhanced their software 'once' followed by 12 % upgraded 'twice', 25 % upgraded 'thrice' and the remaining 25 % never upgraded the software during the study period. 50 % respondents were satisfied for getting after sale service of library software. 50 % respondents were satisfied with performance of library software
 25. With regard to availability of infrastructure facilities (Computers, printers, scanners, digital equipment security systems, operating systems, etc.), the SDAU library was having maximum to the some extent and BSKKV library was having minimum infrastructures. However, all the university libraries under the study lack these facilities to meet demand of the users.
 26. The Local Area Network (LAN) was available with MPKV and LAN facility was the least with BSKKV library. 50 % libraries had the 'Broad Band' Internet connection, 38 % libraries were having Leased Line and remaining 12 % libraries had 'Cable Modem'.
 27. 50 % libraries were subscribing Internet Services from the BSNL, 38 % of from VSNL, 25 % from ERNET India. 63 % libraries were using 'Shared Line', 38 % 'Dedicated Line'. 63 % libraries were having speed more than 1 mbps Internet Services, 25 % having 256 kbps and remaining 12 % libraries were utilizing a speed of 1 mbps Internet Services
 28. Almost all the libraries were having updated the Anti-Virus Software to protect their ICT programmes. All the university libraries were ready to share their resources to each other. 63% respondents had expressed to face problem of computer accessibility 'sometimes'.
 29. The use of Web 2.0 as a tool for scientific communication, 88 % respondents had expressed their inability to use the software, 12 % respondents used this facility rarely. 75 % libraries were having back up facilities of UPS, Inverters and Genets for restoring data in case of power failure
 30. All the libraries were having facilities of CD / DVD, 50 % libraries had LCD Projector, 38 % had Overhead Projector, 38 % had Television, 12 % Film Slide Projector and 13 % used Recorder and Players.
 31. 88 % libraries had initiated for development / creation of digital library with the funds from the ICAR for digitization of their collection.

VI. SUGGESTIONS

1. Although the states in western India have agrarian economy and prominence for development, establishment of new agricultural university need consideration the ICAR, an apex body at national level to plan and support for agricultural education, research in these states ICAR and State Governments may consider for establishing agricultural university.
2. ICAR and Govt. of Goa should take lead to set up Agricultural University in Goa State.
3. Qualified librarians should be appointed in university libraries to cater the need of teaching and research and supporting professional staff should be recruited for effective and efficient functioning of library and information services.
4. PhD degree in LIS should be mandatory for librarians to cope up with the advancement of new technologies in the university libraries.
5. Two university libraries namely AAU and SDAU need to be subscribed professional core journals and develop their collection at the regular interval in the subject of Agricultural and Allied Sciences. International journals needs to acquire and also encourage making use of online journals available in Consortium for Electronic Resources in Agriculture (CeRA). It is also recommended that three universities namely: BSKKV, MKV and SDAU should be provided adequate funds by ICAR for the aforesaid facilities.
6. For electronic journals and online full-text databases to make available to their users for browsing and searching, ICAR should provide more funds for subscribing these international databases.

7. Networking in other agricultural universities of India is to be introduced.
8. Taking into account the existing status and infrastructure of libraries, sufficient grants should be provided by the ICAR for development of libraries.
9. Upgrading the skills and technology, training plan for each library professional through workshop, short term and long term courses may be considered.
10. For use of ICT applications, user education programme is to be introduced, formulated and implemented in order to improve the proficiency, skills and knowledge.
11. RFID security system should be procured and installed in all the universities to protect and safeguard the library documents.
12. A consortia moment for the wide publicity of R & D activities is to be accelerated and development among the university libraries.
13. The activity of use of video conferencing as a library facility should be accelerated and effectively used. The ICT based services can be contributed towards knowledge sharing.
14. The international databases such as CAB abstracts, AGRIS, AGRICOLA and CARIS should be made available online and offline and sufficient funds be made available to the librarians.
15. Translation services are need to be introduced to the research communities in agriculture sector.
16. Hardware and software is to be regularly upgraded so as to improve additional features while delivering services.
17. The total ICT infrastructure should be developed in all the agricultural university libraries of western India.
18. Broadband Internet connection having speed of more than 2 mbps be installed for delivering effective and efficient information services to the users.
19. For digital library project, free Web based open source repository software packages such as Greenstone and DSpace is to be installed and used for collection for digitizing their collection.
20. The networking system should be developed in three states i.e. Maharashtra, Gujarat and Goa.

VII. EXPERT COMMENTS BY RESPONDENTS

Respondents had communicated their valuable comments on overall improvement about university libraries. The respondents from MPKV, NAU and PDKV had provided respectively.

- i. The concept of sustainable development must be cultivated by allocating funds to libraries. Also there is great need of training of staff. Lack of trained staff is also the main hurdle while handling ICT based services. In the complex of ICAR, library staff should have been recruited according to the norms given by the ICAR.
- ii. The joint venture of ICAR and INFLIBNET consortia activities are very useful and valuable, due to the development of ICT, special grants should be provided by the ICAR to develop IT cell in the university library.
- iii. Entire university library collection is to be uploaded on Online Public Access Catalogue (OPAC). Subject catalogue is provided to users.

VIII. CONCLUSIONS

The university and its role in national life, university stands for humanism, for tolerance, for reasons, for adventure of ideas and for search of truth. It stands for the onward march of human race towards even higher objectives. If the university discharges their duties adequately, then it is well with the nation and the people. These great words highlight the basic truth that universities have a crucial part to play in life, welfare and strength of nation. The universities are the dwelling places of ideas and idealism and expect high standard of conduct and integrity of all the members. While achieving these objectives of the agricultural university libraries have a great potential to help bridge the information gap between the haves' and have not. While keeping this view in mind, these objectives in general state agricultural universities being attempted to achieve these objectives specific mandates had been developed by the agricultural universities. These mandates are: a) train the man power needed for agriculture, animal husbandry and allied sectors for the development of the state (education). b) constantly improve and generate technologies for increasing production in agriculture, animal husbandry, home science and allied sectors and c) assist through the development departments of the government, in the process of dissemination of the improved technologies to the farmers of the state (extension/ transfer of technology). Thus, the use of ICT played a prominent place while discharging the library services.

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