
Evolving Library Services in Agri-Education: A Survey of Resource Utilization, Academic Impact, and ICT Challenges at S.V. Agricultural College, Regional Library, Tirupati ANGRAU

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Abstract

The present paper is an attempt to explore the transformation of libraries, information resources, services, and products in this electronic era due to the wide impact of Internet, electronic, communication and information technology. The study also includes a survey among the students of master of agricultural sciences Post Graduate students and Research Scholars to know about their views on the changing informational requirements of them and what they expect from the libraries in this digital era. A survey method has been adopted to get the data from the targeted users. Out of a total 220 administered questionnaires, 186 completely filled questionnaires were received back and found valid for analysis the response rate is achieved (@84.5%. The study finds that 76.9% of the postgraduate, Research Scholars of agricultural students have good awareness and use of digital resources and services, while 79.6% of the respondents access e-journals easily and 65.6% of the respondents access e-books easily. It is also explored by the study that WEB OPAC is the most utilized resource by the respondents 100% for their academic and research endeavors, while 47.8% respondents reported time constraints hinder their ability to access digital information resources. The study concluded with the suggestion that practical session and short-term training programs particularly on e-learning must be conducted to improve the use of digital resources and services among the agricultural students and other research fraternity.

Keywords: *Agricultural library, Digitization, CeRA, e-Journals, e-Books, WEB OPAC, e-Resources.*

1. Introduction

India remains predominantly an agrarian economy, sustaining livelihoods for roughly three-fourths of its population while accounting for about half of the national income. Food grain output surged from 50.8 million tones in 1950-51 to 250 million tones by 2011-12 over six decades, with agriculture expanding at an annual rate of 3 percent; the country ranks as the world's fourth-largest food grain producer, holding substantial scope for further growth.

The sector contributes approximately 17 percent to national GDP, though a sustained 4 percent annual growth is deemed essential to support an overall 9 percent GDP target. With India's population projected to hit 1.4 billion by 2025 and 1.6 billion by 2050, annual food grain demand could climb to 380 million tones and 450 million tones respectively—far exceeding the then-current 250 million tones production.

Indian agriculture has steadily adapted to address the expanding and varied demands of stakeholders across low-biomass crops, horticulture, livestock, fisheries, and human resources through comprehensive national programs. Targeted initiatives have bolstered food and cash crop supplies, such as the Grow More Food Campaign (1940s) and Integrated Production Program (1950s).

From the 1960s onward, transformative "revolutions" emerged, including the Green Revolution (crops), Yellow Revolution (oilseeds, 1986-1990), White Revolution (dairy, 1970-1996), and Blue Revolution (fisheries, 1973-2002), positioning India as the global leader in milk, fruits, cashew nuts, coconuts, ginger, turmeric, bananas, sapota, pulses, and black pepper production.

2. Agricultural Education and Research in India

India's agricultural education and research sectors are advancing effectively. Key areas such as soil and water management, land use optimization, field and forage crop cultivation, environmental sustainability, agro-biodiversity preservation, resource conservation techniques, integrated pest management, pesticide residue control, seed production methods, agricultural energy use, biotechnology, intellectual property rights, marketing and trade practices, and indigenous knowledge systems all play crucial roles in contemporary agricultural education, research, and extension efforts.

The Government of India has long acknowledged the importance of a robust scientific education framework for agriculture. As the nation's premier scientific body, the Indian Council of Agricultural Research (ICAR)—the cornerstone of the National Agricultural Research System (NARS)—coordinates agricultural education, research, and extension nationwide. It operates through an extensive network that includes 49 ICAR research institutes, 4 deemed universities, 6 national bureaus, 25 project directorates, 8 zonal project directorates, 17 national research centers, 138 ICAR substations, 79 All India Coordinated Research Projects, 10 additional projects, 17 network projects, 630 Krishi Vigyan Kendras (KVKs), 52 State Agricultural Universities (SAUs), 1 Central Agricultural University, and 4 central universities with agriculture faculties.

Success in research and development initiatives hinges on the caliber and volume of researchers' contributions, supported by technical and administrative infrastructure. Library and Information Centers (LICs) serve as essential pillars in this ecosystem, facilitating information dissemination and ensuring scientists stay current with cutting-edge advancements in their disciplines.

Historically, agricultural universities' research and development (R&D) activities in farming sectors received strong encouragement. Multiple committees and commissions shaped these efforts, including the University Education Commission led by Dr. S. Radhakrishnan (1948); the first Joint Indo-American Team on Agricultural Research and Education, involving Dr. Ralph R. Shaw and Dr. D. K. Krishna (ICAR library librarian, 1954); the Second Joint Indo-American Team on Agricultural Education, Research, and Extension chaired by Dr. M.S. Randhawa (1959); the High Level Agricultural Research Review Team (1963); the University Education Commission under Dr. D.S. Kothari (1964); the National Commission on Agriculture (1970); and the National Commission on Farmers chaired by Dr. M.S. Swaminathan (2007). These bodies offered key recommendations to enhance agricultural research and education.

3. Role of Libraries and Information Centers

Various committees and commissions have positioned Library and Information Centers (LICs) as pivotal hubs, enabling scientists and technologists to leverage advancements in agriculture. These centers primarily seek to cultivate an agricultural society capable of thriving prosperously and culturally, while upholding core life values. Advancements in technology have dramatically enhanced LICs' offerings, facilities, and outreach, empowering libraries to deliver essential knowledge, skills, value instillation, and vocational training—resources indispensable for comprehensive human progress.

Post-independence, agricultural libraries began providing dedicated information services, with committees and commissions affirming documentation and information handling as core library functions. ICAR's contributions to advancing agricultural libraries and services merit recognition, including guidance from its Standing Advisory Committee on library-related matters and operations.

The ICAR Headquarters library launched a central information service via projects and Agricultural Research Information Centers (ARIC), which deliver Selective Dissemination of Information (SDI) through CD-ROMs from the International Information System for the Agricultural Sciences and Technology (AGRIS) database, alongside producing the Indian National Agricultural Bibliography (1974-84). These efforts hold national significance as focal points for FAO's AGRIS and Current Agricultural Research Information System (CARIS) initiatives, as well as for the South Asian Association for Regional Cooperation (SAARC) Agricultural Information Centre.

Technological progress has intensified focus on disseminating scientific and technical knowledge. Institutions involved in education, research, and extension both generate and utilize such information for researchers, faculty, and students. Swift IT evolution has introduced novel electronic devices, media, and formats.

A fundamental transition is underway: from print materials to digital formats, document ownership to information access, and physical libraries to virtual ones. While electronic resources cannot entirely supplant print collections, they substantially enrich them. These resources span CD-ROMs, DVDs, floppies, online databases, repositories, and digital archives—encompassing natively digital content, digitized print originals, and dual-format materials.

An information society has taken shape, where information's creation, distribution, dissemination, application, integration, and processing drive major economic, political, and cultural dynamics. Viewed as the evolution beyond industrial society, it aligns with notions like post-industrial society, mass production phase, postmodern society, knowledge society, telematics society, information revolution, liquid modernity, and network society.

4. Information and Communication Technology (ICT)

Information and Communication Technology (ICT) now serves as both a communication channel and a key resource for research and development (R&D) in agriculture. Scientific literature has expanded rapidly in recent years, encompassing articles, journals, and books. ICT tools such as library management software, operating systems, telecom products, database management systems (DBMS), and desktop publishing (DTP) support general information management, with particular emphasis on search and retrieval functions.

No single, universally accepted definition of ICT exists, owing to its ongoing evolution in concepts, methods, processes, systems, and applications. Often viewed as an extension of Information Technology (IT), ICT more broadly highlights integrated telecommunications (including telephone lines and wireless signals), computers, enterprise software, middleware, storage solutions, and audiovisual systems that allow users to create, access, store, transmit, and process information.

In this context, ICT plays a critical role in providing Library and Information Services (LIS), where computer-based offerings are typically termed information services within the LIS field. Consequently, ICT's integration into agricultural research systems has grown increasingly vital.

5. About S.V. Agricultural College, Regional Library, Tirupati

Higher education institutions bear primary responsibility for equipping students, researchers, and faculty with cutting-edge knowledge and skills, where a well-stocked and efficiently managed library stands as a fundamental requirement. Scientific research relies on libraries alongside laboratories. The Regional Library assumes diverse responsibilities and functions, playing a crucial role in university-level education and research by supplying essential knowledge resources.

The S.V. Agricultural College Library began operations upon its inauguration on August 7, 1963, initially stocked with 533 books acquired by various college departments, plus transfers from

Agricultural College, Bapatla, to serve students and staff right away. The library expanded significantly following the establishment of Acharya N.G. Ranga Agricultural University (APAU) in 1964. On August 11, 1982, it merged with the College of Veterinary Science library, boosting holdings to 34,488 volumes; it later separated from S.V. Veterinary University Library in 2007 to operate independently as the ANGRAU Regional Library, now maintaining 25,938 volumes.

In 2007, the Regional Library relocated to its dedicated building at S.V. Agricultural College. It operates 11 hours daily on weekdays and shorter hours on public holidays and Sundays. College students and staff qualify for membership, while verified outsiders with institutional introduction letters may access the reference section. The library maintains databases for books, journals, theses, reports, and references, accessible via WEB OPAC; it also catalogs current periodicals, CDs, subscribed online journals, and digitized theses. Contributions include a workstation for the NARS e-Granth project to digitize pre-1960 resources, plus 2023 installations of RFID (Radio Frequency Identification), self-check drop boxes, and smart card systems at the S.V. Agricultural College Regional Library, Tirupati.

Statement of the Problem of Present Research

Despite the initiatives taken to establish the libraries in agricultural universities and apex level institution is established to plan and coordinate the education and research in agricultural field and setting up of libraries, the use of ICT is not up to the expected level in agricultural universities in general and agricultural colleges, in Andhra Pradesh, Infrastructure required for development and use of ICT is also taking. The problems of the research study is therefore considered **“Evolving Library Services in Agri-Education: A Survey of Resource Utilization, Academic Impact, and ICT Challenges S.V. Agricultural College, Regional Library, Tirupati: ANGRAU**

Information Resources	Quantity
Books	25938
Bound Journals	8716
Thesis	4840
CD-ROM Databases	160
Books CDs	2810
Theses CDs	4840
E-books	1548
E-Journals	6211
EBSCO E-Books Academic Collection	3200
NIPA Computer Examination Package	

Table1: Current Status of the Regional Library, S.V. Agricultural College, Tirupati

6. Objectives

The main objectives of the current study are:

- To find out the awareness and use of digital resources among the agricultural students
- To assess the accessibility of digital resources
- To evaluate the utilization of digital services
- To explore the impact of digital resources and services on academic performance
- To identify challenges and barriers in accessing digital information resources
- To recommend improvements on how to improve digital information services and resources
- To discover students' perceptions towards the digitization in library services

7. Scope and Limitations of the Study

The Scope of the present study is limited to the repositories to S.V. Agricultural College, Regional Library, Tirupati, the study discussed about information communication Technology services electronic information resources, awareness access and use by the repositories including post graduate students and research scholars for their reference and use for apprising other to emulate.

8. Review of Literature

A substantial body of work has examined how students, research scholars, and faculty use ICT-based resources in academic settings worldwide. Prior studies have focused on patterns of access, usability, and the impact of electronic and networked information systems in higher education.

Muniswamy and Swaroop (2005) evaluated how users at NIT Tiruchirappalli use and perceive the usability of electronic journals. Cholin (2005) reviewed the implementation of information technology in Indian university libraries, highlighting how systems like INFLIBNET and UGC–INFONET CeRA (Consortium of e-Resources in Agriculture) enhance access to resources within and beyond campus libraries.

Similarly, Azubogu and Madu (2007) surveyed teaching staff at Imo State University in Nigeria, finding high levels of computer and internet use. Respondents cited reasons such as ease of use, convenience, free access, and availability of information at no cost as drivers for extensive internet adoption.

Most recently, Dr. T. Ramalakshmi and Dr. T. Sreenivasa Rao (2024) investigated ICT resource utilization by students and research scholars at S.V. Agricultural College, Regional Library, ANGRAU, offering institution-specific insights that closely align with the present case study.

9. Research methodology

This study employed a questionnaire-based survey approach to gather data. Structured questionnaires were distributed to postgraduate (M.Sc. Agriculture) students during July-August 2024, with 220 forms issued in total. Of these, 186 were returned completed, yielding an 84.5% response rate, and the results underwent simple percentage analysis to align with the research objectives.

10. Data analysis and interpretation

The Data was collected through questionnaires administered to the users of different categories, including UG students, PG students and Research Scholars related with the discipline of agricultural sciences of ANGRAU, S.V. Agricultural College, Regional Library, Tirupati. The data has been thoroughly analyzed, scrutinized and presented into the following successive tables with their interpretations.

Awareness	Respondents	Percentage (%)
Fully aware	59	31.7%
Aware	84	45.2%
Partially aware	32	17.2%
Not aware	11	5.9%
Total	186	100%

Table 2: Number of Questionnaires Distributed and Rate of Response
The collected data were arranged and interpreted in the following tables

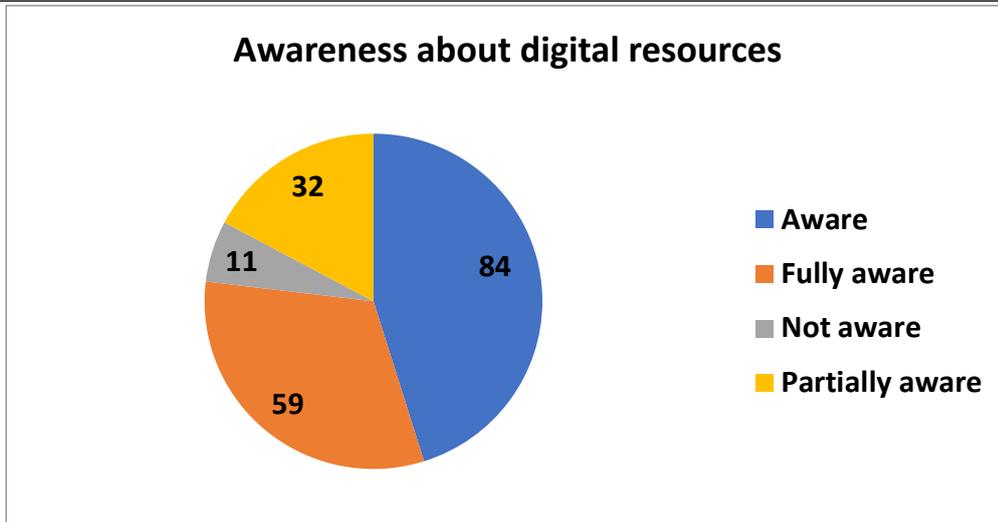
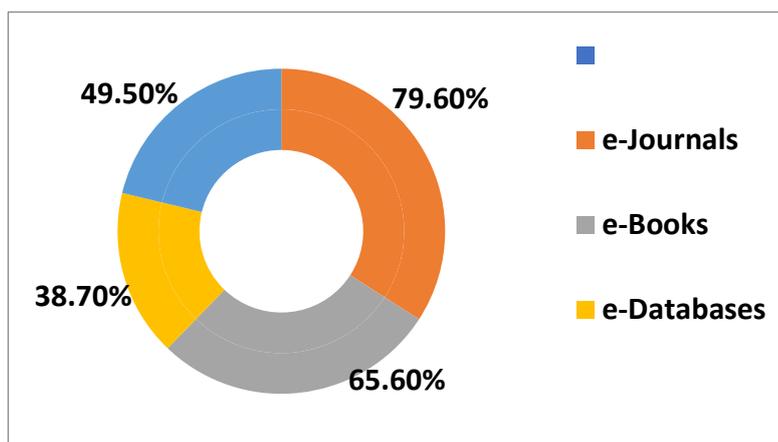


Table 2 shows data about Digital Resources among the respondents 31.7% is fully aware, 45.2% were aware, 17.2% of partially aware and 11% of users are not aware of using the Digital Resources which was providing by the S.V. Agricultural College, Regional Library, Tirupati.

Easy accessibility	Respondents (n=186)	Percentage
e-Journals	148	79.6%
e-Books	122	65.6%
e-Databases	72	38.7%
Other e-Resources	92	49.5%

Table 3: Easy accessibility of digital resources

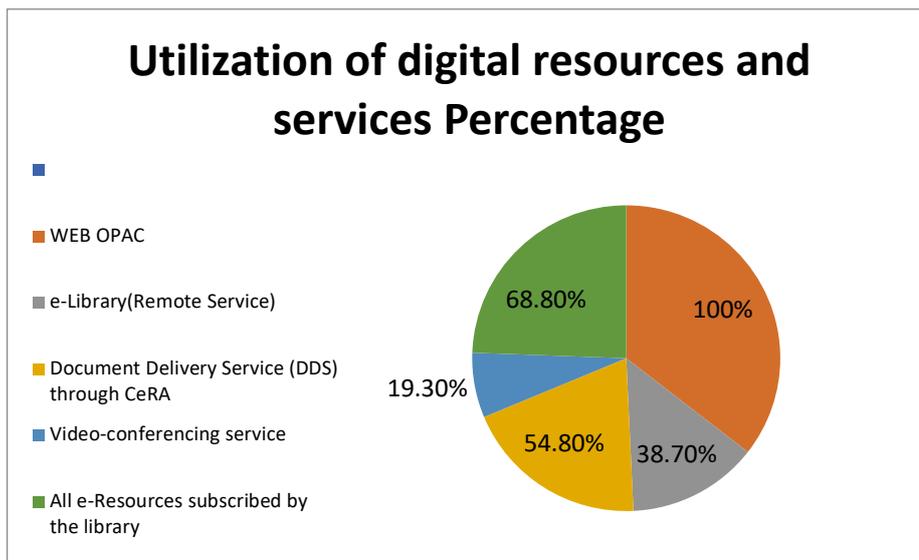


The data shows in Table 3 reveals that the easy accessibility of digital resources among the postgraduate (M.Sc. Agri.) Research Scholars. The results noticed that 79.6% of the respondent were able to access the e-journals easily through use in the remote access from the library as well as their respective departments, whereas, 65.6% of the respondents were able to access e-books easily. 38.7% of students were aware of e-Databases were as 49.5% of students are accessing the other e-Resources (CABI, Indian Stat, NIPA, Arts and Science etc.,)

Easy accessibility	Respondents (n=186)	Percentage
WEB OPAC	186	100%
e-Library(Remote Service)	72	38.7%
Document Delivery Service (DDS) through CeRA	102	54.8%

Video-conferencing service	36	19.3%
All e-Resources subscribed by the library	128	68.8%

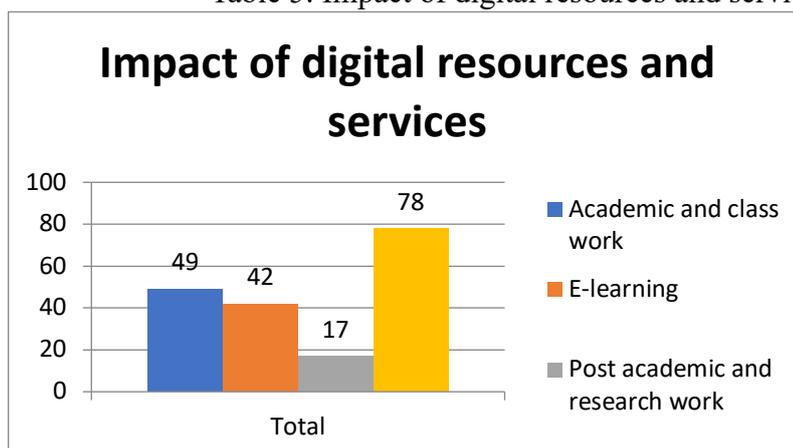
Table 4: Utilization of digital resources and services



The Table No. 4 highlights the utilization of digital resources by the respondents offered by the S.V. Agricultural College, Tirupati. It was explored during the study that all respondents used the OPAC, indicating it is the most utilized resource which supports students' academic and research Scholars. On the other hand, 68.8% percent of the respondents reported using all the electronic resources available through the library, whereas, 54.8% respondents utilized the Document Delivery Services through CeRA, indicating a moderate level of use among the respondents, followed by e-library (Remote Access Service), which is utilized by 38.7% and video-conferencing service by 19.3% indicating the least engagement among the listed resources. The analysis shows that a significant portion of respondents take advantage of a range of e-resources offered by the S.V. Agricultural College, Regional Library, Tirupati.

Easy accessibility	Respondents	Percentage
E-learning	42	22.6%
Research work	78	42%
Academic and class work	49	26.3%
Post academic and research work	17	9.1%
Total	186	100%

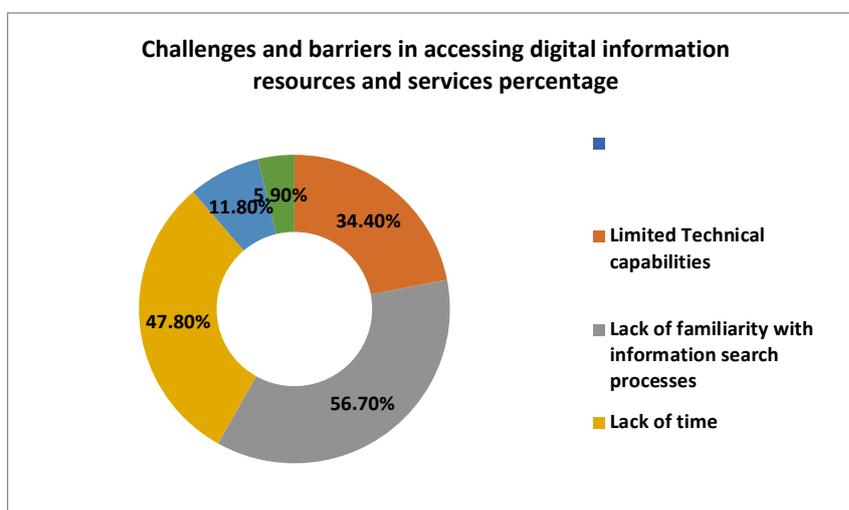
Table 5: Impact of digital resources and services



The data shows in Table 5 depicts the relationship between the availability and usage of digital library resources and its impact on academic performance of the respondents. The study found that 42% of the respondents were using digital resources and services for research work, whereas, 26.3% of the respondents using digital resources and services for their academic and class work, followed by e-learning 22.6% and post academic and research work 9.1% respectively. The analysis shows that digital resources and services are affecting the overall academic, research and e-learning environment of targeted agricultural postgraduate students as well as Research Scholars of S.V. Agricultural College, Regional Library, Tirupati.

Challenges and barriers	Respondents (n=186)	Percentage
Limited Technical capabilities	64	34.4%
Lack of familiarity with information search processes	98	56.7%
Lack of time	89	47.8%
Lack of ICT infrastructure	22	11.8%
Speed issue with Internet	11	5.9%

Table 6: Challenges and barriers in accessing digital information resources and services



Various challenges and barriers faced by respondents in accessing digital information resources and services are represented by the data given in Table 6. Lack of familiarity with information search processes is the most reported challenge, with 56.7% respondents indicating that they are not familiar with how to search for information effectively. Similarly, 47.8% respondents reported that time constraints hinder their ability to access digital information resources for their busy schedule in their research. while, 34.4% respondents reported having limited technical skills as a barrier, which indicates that a significant portion of users may face difficulties in effectively utilizing digital resources due to a lack of technical knowledge. Another side, 11.8% respondents mentioned that inadequate information and communication technology infrastructure is a barrier in accessing digital resources and services, whereas, only 5.9% respondents reported having issues with Internet speed and network, which affects their access to the digital information resources and services. The analysis shows that enhancing users' skills and familiarity with digital resources could potentially improve access and utilization of digital information resources and services.

Recommendations	Respondents	Percentage
Practical sessions on e-learning	96	51.6%
Short term sessions on the practical use of digital resources and tools	112	60.2%
Orientation on how to use ICT tools in agricultural research	74	39.8%
Motivation factor	58	31.2%
Staff behavior and competencies	62	33.3%

Table 7: Recommendations to improve the use of digital information resources and services

Table 7 reveals that enhancing the use of digital information resources and services in academic and research endeavors of the Repositors of S.V. Agricultural College, Regional Library, Tirupati. The data reflecting in the above Table indicates that nearly half of the respondents 51.6% believe that practical sessions focused on e-learning are important for improving the use of digital resources and services. Another side, over sixty percent of the respondents 60.2% indicates a strong preference for short-term sessions that provide practical training on use of digital tools and resources and services, while 33.3% respondents believe that enhancing staff behavior and competencies is essential for better utilization of digital resources and services. Similarly, about a quarter of the respondents 39.8% feel that orientation sessions specifically focused on ICT tools in agricultural research are necessary. followed by motivation as a key factor for 31.2% respondents in improving the use of digital resources. The recommendations reflect a collective desire for hands-on learning experiences to effectively leverage digital information resources and services.

Perceptions	Respondents (n=186)	Percentage
Usefulness of digital resources	132	70.9%
Effectiveness of digital versus traditional resources	96	51.6%
Digital resources are easy to use	110	59.1%
It saves times, storage and budget	114	61.3%
Longevity of digital resources	82	44.1%
Easy to access and share 24x365	148	79.6%

Table 8: Perceptions towards digitalization in library resources and services

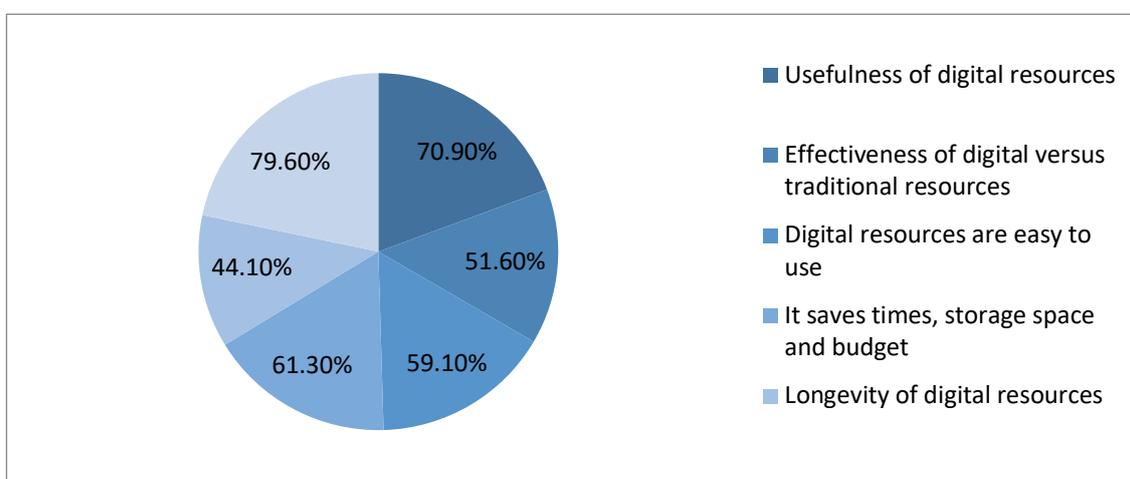


Table 8 reveals the user perceptions regarding the digitization of library resources and services, and the data shows that a strong majority 79.6% of respondents believe that digital resources are easy to access and share at any time throughout the year, while a significant majority 70.9% of respondents perceives digital resources as useful. On the other hand, more than half 61.3% of respondents agreed that digital resources contribute to savings in time, storage space and budget resources contribute to

savings in time, storage space, and budget, whereas, just over half 59.1% of respondents find digital resources easy to use. Nearly half 51.6% of the respondents believe that digital resources are effective compared to traditional resources, while less than half 44.1% of respondents perceive digital resources as having longevity. The analysis shows that the perceptions towards digitization in library resources and services reflect a generally positive outlook; however, during the study, it was realized that there should be focus on providing practical training and support to users, ensuring a balanced approach that values both digital and traditional resources and service.

Satisfaction level	Respondents	Percentage
Highly satisfied	81	43.5%
Satisfied	53	28.5%
Neutral	39	21%
Dissatisfied	13	7%
Highly dissatisfied	0	0
Total	186	100%

Table 9: Satisfaction towards use of e-resources and digitization

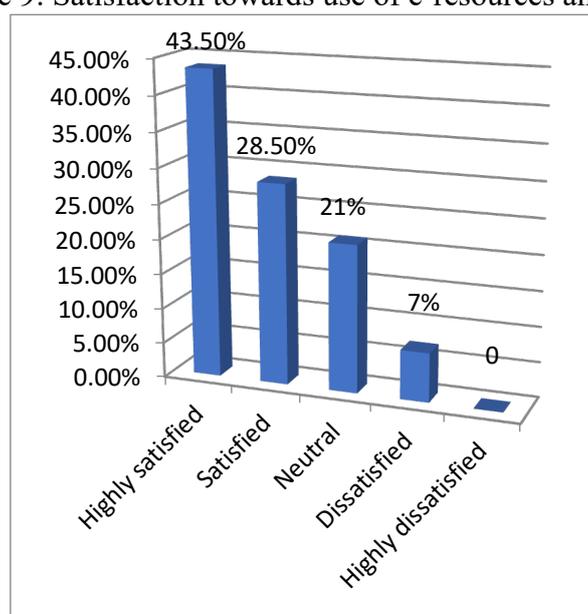


Table No. 9 shows that satisfaction towards the use of e-resources and digitization, it was found that a 43.5% of respondents Highly satisfied, 28.5% respondents were Satisfied totally 72% of the Repositors express a positive satisfaction level towards e-resources and digitization, indicating a strong acceptance and appreciation of digital resources among the Repositors . On the other hand, 21% of respondents who were neutral suggest that there is a segment of users who may not have a strong opinion or experience with e-resources and need to enhance their experiences in use of digital resources and services. Only 7% of respondents expressed dissatisfaction and none reporting being highly dissatisfied, it reflects that the majority of users are at least content with the e-resources available to them, which shows a positive indicator for the effectiveness of digital offerings.

The satisfactory levels towards e-resources and digitization are predominantly positive with a significant majority of users expressing satisfaction; however, there remains a portion of users who are neutral or dissatisfied, indicating that libraries should continue to seek ways to enhance user experience and engagement with digital resources and services.

11. Summary of major findings

India's agricultural libraries, exemplified by the S.V. Agricultural College Regional Library in Tirupati, have undergone significant digital transformation, with high user awareness and utilization but persistent barriers requiring targeted training.

Awareness and Access

- 76.9% of postgraduate agricultural students and research scholars (186 respondents from 220 surveyed) reported good awareness of digital resources and services.
- 79.6% easily accessed e-journals, 65.6% accessed e-books, 49.5% used other e-resources (e.g., CABI, Indian Stat), and 38.7% reached e-databases.

Utilization Patterns

- WEB OPAC emerged as the most popular tool, used by 100% of respondents for academic and research needs.
- 68.8% utilized all subscribed e-resources, 54.8% employed Document Delivery Service via CeRA, 38.7% used e-library remote services, and only 19.3% engaged video-conferencing.

Academic Impact

- 42% applied digital resources primarily for research work, 26.3% for academic/class work, 22.6% for e-learning, and 9.1% for post-academic/research tasks.

Challenges and Barriers

- 56.7% cited lack of familiarity with information search processes as the top issue, followed by time constraints (47.8%), limited technical skills (34.4%), inadequate ICT infrastructure (11.8%), and internet speed problems (5.9%).

User Perceptions

- 79.6% viewed digital resources as easy to access/share 24/7, 70.9% found them useful, 61.3% noted time/storage/budget savings, 59.1% deemed them easy to use, 51.6% saw them as effective vs. traditional resources, and 44.1% believed in their longevity.

Satisfaction Levels

- 43.5% were highly satisfied, 28.5% satisfied, 21% neutral, and 7% dissatisfied with e-resources and digitization (0% highly dissatisfied).

Recommendations

- 60.2% favored short-term practical sessions on digital tools, 51.6% wanted e-learning Practicals, 39.8% sought ICT orientations for agricultural research, 33.3% emphasized staff competencies/behavior, and 31.2% highlighted motivation.

9. Conclusion

This study illuminates the profound digital transformation reshaping agricultural libraries like the S.V. Agricultural College Regional Library in Tirupati, where postgraduate students and research scholars demonstrate robust awareness (76.9%), high utilization of tools like WEB OPAC (100%), and positive impacts on research (42%) and academics, alongside strong satisfaction levels (72% positive). Yet, persistent barriers—such as unfamiliarity with search processes (56.7%), time constraints (47.8%), and skill gaps—underscore the need for proactive interventions to unlock full potential.

Key Implications

- Digital resources excel in accessibility (e.g., 79.6% for e-journals) and efficiency (61.3% cite time/space savings) but cannot thrive without user empowerment.

- Libraries must prioritize hands-on training: short-term digital tool sessions (60.2% endorsement), e-learning practical's (51.6%), and ICT orientations tailored to agricultural research (39.8%).

Forward Path

Enhancing staff competencies, motivation, and infrastructure will bridge gaps, ensuring digitalization not only augments but elevates agricultural education and R&D outcomes at ANGRAU and beyond, fostering a more innovative, self-reliant agrarian future.

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