

## Empowering research in digital environment: a collaborative approach by Indian agricultural libraries and research centres

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**Abstract.** The article discusses the use of digital platforms, consortiums, collaborative online catalogues that have substantially transformed the Indian agricultural libraries and are playing a significant role in research support in digital environment. It describes the use of CeRA (Consortium for e-Resources in Agriculture) online platform in Pantvarsity for the five years. It is shown that the use of these e-resources by the academic community of the university has a declining trend. The analysis has revealed that while research information available through the platform is highly valued in the university system, many patrons including students and faculties both are not largely dependent only on the consortium resources, and are likely be comfortable with other easily available open access research materials over the web, repositories or print journals and digital repositories. The author suggests that librarians should create greater awareness about the consortium resources, identify barriers, faced by the academic community in accessing these resources for fruitful utilization of this platform.

**Keywords:** e-resources, research support, agricultural consortium, India, academic library, e-journals, digital library

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## Расширение возможностей для исследований с использованием цифровой среды: совместный подход сельскохозяйственных библиотек и исследовательских центров Индии

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**Аннотация.** В статье рассматривается использование цифровых платформ, консорциумов, совместных онлайн-каталогов, которые в значительной степени трансформировали индийские сельскохозяйственные библиотеки и которые играют значительную роль для поддержки научных исследований. Описано исследование использования электронных ресурсов консорциума на онлайн-платформе CeRA (Consortium for e-Resources in Agriculture – консорциум электронных ресурсов в сельском хозяйстве) в университете сельского хозяйства и технологий имени Г. Б. Панта (Индия) за последние пять лет. Показано, что их использование академическим сообществом университета имеет тенденцию к снижению. Анализ показал, что, в то время как исследовательская информация, доступная через платформу, высоко ценится в университетской системе, многие пользователи, включая студентов и преподавателей, в значительной степени используют не только ресурсы консорциума и, вероятно, удовлетворены другими исследовательскими материалами в открытом доступе, например журналами по физике или цифровыми хранилищами. Автор предполагает, что ученые и библиотекари должны быть больше осведомлены о ресурсах консорциума, о барьерах, с которыми сталкивается научное сообщество при доступе к этим ресурсам для плодотворного использования этой платформы.

**Ключевые слова:** электронные ресурсы, поддержка научных исследований, консорциум библиотек сельскохозяйственных университетов, Индия, научная библиотека университета, электронные журналы, цифровая библиотека

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### Introduction

The Republic of India has a great network of 71 universities in agricultural sciences, 98 Research Institutes, including National Research Centres, Project Directorates and National Bureaux<sup>1</sup>. They are spread across different states of the country to further growth in agriculture sector and deal with research activities, teaching, extension and also producing qualified and trained manpower to work exclusively towards achieving the food security for 1,353 billion people living in the country, as World bank reports<sup>2</sup>. It is necessary to add here,

<sup>1</sup> Indian Council of Agricultural Research (ICAR). URL: <https://icar.org.in/content/deemed-universities> (accessed 25.05.2019).

<sup>2</sup> World Bank Report, India. URL: <https://data.worldbank.org/country/india> dated July 2019 (accessed 10.06.2019).

that the Indian agricultural universities focus on science and technology disciplines through their constituent colleges besides agriculture and allied sciences.

Libraries play an important role in supporting the mission of the academic institutions and also advance the success and impact of academic community by providing access to information and knowledge. The Indian agricultural libraries were slow in transforming their services in automated and digital environment in the past two decades for reasons of financial resources, skills and expertise. The launch of the world bank and the government of India supported National Agricultural Innovative Projects (NAIP) in the year 2006, implemented by the Indian Council of Agricultural Research (ICAR) (Rao et al., 2013), brought new ideas to empower research in digital environment.

Under strengthening of “Digital Library and Information Management” of Indian National Agricultural Research System (NARS) several projects were initiated in 2007 in coordination with State Agricultural Universities and this marked a new realm, insight, vision and transformation in library services and its transition from print to digital sources. These projects largely aimed to strengthen agriculture research more IT oriented to meet the latest trends in market and ever changing demands of the consumers, this also applies to the patrons of the libraries and academic community.

Various projects like e-Granth (comprising Krishikosh, AgriCat-online union catalogue) and CeRA (Consortium for e-Resources in Agriculture) initiated through the Indian Council of Agriculture Research (ICAR) with grants from world bank have transformed the accessibility to the research resources and have empowered the research activities in the country. Most research resources that were lying in closed libraries walls have been brought to the digital platforms. If we look at some of the projects, for example Krishikosh; digitized the rare and old books, technical/research reports, unpublished work and journals available in member libraries, these have been made accessible through the platform (<http://krishikosh.egranth.ac.in>). Project E-Granth also brought the concept of collaborative or the union catalogue making the catalogue of currently more than 200 libraries accessible over web through IDEAL (Indian Digital Ensemble of Agricultural library) platform, created for capturing, digitizing and sharing learning resources<sup>3</sup>. Project Krishiprabha now merged with Krishikosh digital repository digitized the physical research materials submitted by students in form of theses and dissertations are accessible through this platform. The researchers are no longer required to visit different libraries to access research resources.

Access to e-journals from reputed publishers across the globe is being provided to the agricultural and allied sciences academic community through CeRA-platform in a cost effective way. These initiatives of the libraries through collaborative projects have led to empowering research for the academic community in digital environment and are being sustained continuously by support from the central government. The Indian agricultural libraries have also transformed from physical stand alone dull libraries to digital platforms IDEAL.

Thus, digital technologies and online access to information resources have brought increased expectations from library professionals to reform their services in digital environment. Most of the Indian academic libraries serving agricultural universities have undergone dramatic changes in

their functioning due to the influence of information and communication technology. The libraries have moved from automated services to digital platforms and portals to open up and deliver web based content and, services accessible everywhere, 24×7. They are now more focused towards making information resources accessible not only from remote but also in-house locations.

The Indian agricultural research institutions and state agricultural universities have made all efforts to upgrade and remodel the library and information services in digital and collaborative era.

In the present context it is difficult for the libraries to sustain in their mission individually. It is noted that without a sustainable flow of adequate grants no library can afford to provide all published research resources digitally or through traditional channels. In this scenario, importance of digital libraries, consortiums, digital repositories and digital platforms for collaborative networking and sharing resources has become more relevant today among the Indian libraries.

The tendency of organizing library consortiums (Mallery, Brar, 2013; Matheson, 2013; Robinson, 2014), digital repositories (Kargon, 2019), collaborative networking (Ding et al., 2020; Fresnido, Yap, 2013) and sharing resources (Chisita, Chinyemba, 2016) is seen all over the world and on different themes.

This article will discuss briefly various library projects of the Indian agricultural libraries that have led to their digital transformation and to empowering agricultural and allied sciences research in digital environment by providing access to e-resources to facilitate and support research and scholarly communication through various platforms, like CeRA which is reviewed in detail – as a consortium approach providing access to latest research information to all state agricultural universities and institutes in National Agricultural Research and Education System (NARES); Krishikosh – open access digital repository; IDEAL; AgriCat union catalogue etc. in a cost effective way to deliver research information to the academic community in digital environment. The article also discusses a case study about the use of consortium e-resources by the academic community of G. B. Pant University of Agriculture and Technology, and further explains about the research support it provides, especially on use and impact of e-journals (facilitated through the consortium) by the students and faculty members of this university and the role of Information literacy programmes and courses like research methodology to enhance research skills. Analyzes the pattern of use of CeRA e-resources from 2014 to 2018.

## 1. Digitization for Resource Sharing

The Indian state agricultural universities and ICAR research institutes have huge collection of valuable research material in the form of theses/

<sup>3</sup> Indian Digital Ensemble of Digital Libraries (IDEAL): a platform of Indian agricultural libraries URL: <http://agricat.egranth.ac.in/cgi-bin/koha/opac-main.pl> (accessed 14.06.2019).

dissertations, rare books, research reports and gray literature, in-house periodicals and extension literature spread across the country. For researchers fast access to existing scientific outputs and scholarly information on their topics of interest is as important as the current or latest scientific information. Therefore, the idea to digitize existing available research resources is crucial.

A large number of physical research resources/print sources available in libraries of agricultural universities and research institutes have been digitized under project E-Granth-Krishikosh to open up the resources scattered in different institutions and have been made available through open access digital repository platform called Krishikosh (<http://krishikosh.egrnth.ac.in>), which is accessible everywhere. The repository has been designed using DSpace and has been developed essentially to meet the requirements of the research community. Krishikosh provides a ready platform for the libraries (similar to cloud services) to start their institutional self-managed repository without having to bother about the need to procure buy the related infrastructure of hardware's and software's. Each university/research institute under this repository have been configured as a community in DSpace having its own logo and collection.

The research community have been facilitated to access the resources of the repository through online platform. Currently Krishikosh repository has 103 members – State Agriculture Universities/ICAR institute libraries<sup>4</sup>. Initially started with 12 libraries Krishikosh has made a great progress. In order to make the research information available to the academic community, nodal officers have been identified in all agricultural universities and research institutes. They strengthen digital repository and ensure that universities upload their e-theses after the embargo period. Currently 160 000 articles and more than 100 000 theses are available in Krishikosh repository<sup>5</sup>.

Earlier, researchers and students had to visit different libraries physically to have access to these resources for literature review and reference which is now a thing of the past. Krishikosh is “One Stop” platform for research resources from various state agricultural universities and ICAR institutes in the country. It provides an alternate source of scientific information to support the quality of research and teaching (Jain et al., 2016).

## 2. Collaborative Web based Catalogue

Most Indian agricultural institution's libraries are automated and have online catalogues accessible

<sup>4</sup> KrishiKosh: an institutional repository of Indian National Agricultural Research System. URL: <http://krishikosh.egrnth.ac.in/> (accessed 12.06.2019).

<sup>5</sup> KrishiKosh: a digital repository of NARS. URL: <http://krishikosh.egrnth.ac.in/aboutUs.html> (accessed 12.06.2019).

on their library website. The online catalogues of individual libraries are scattered, though information is retrievable 24×7, the patrons have to explore online catalogues of different libraries to get the required information or the research materials. In order to empower the researchers with freely available information E-Granth-AgriCat, a project to create a union catalogue, was conceived earlier in 2006 under NAIP project. The vision was to empower research and learning by facilitating access to catalogue of all state agricultural universities and ICAR research institutions in the country for information available in different libraries at one platform and also to bring the learning resources closed in the buildings of several libraries visible, open and accessible over a common online platform. Initially starting with 12 libraries having large collection of learning resources collaborated to develop a union catalogue in association with OCLC (Dublin, Ohio) to open up their resources worldwide under one platform i.e. “AgriCat” in the country and linked it with “WorldCat” one of the largest library network in the world.

The incentive to bring more libraries under AgriCat union catalogue continued and later an updated version AgriCat 2.0 was developed based on open source library management software KOHA by incorporating the catalogue data of 12 partner libraries into a new platform called IDEAL, the Indian Digital Ensemble of Agriculture Library. The new AgriCat 2.0 was developed locally to sustain the union catalogue, considering the huge recurring cost that was involved in paying as membership fee to the OCLC. Currently more than 200 libraries are members<sup>6</sup> and making their resources accessible to the academic community for research and teaching. The platform is open to all libraries, IDEAL is ready-to-use platform to facilitate agricultural libraries having infrastructure and financial constraints to adopt open source KOHA integrated library management system for their in-house automated activities and also to share their library's holdings through a common online union catalogue accessible through a single window or platform (fig. 1).

The integrated catalogues of the participating libraries are accessible to the academic community through this platform round the clock at their desktops irrespective of locations. The Indian agricultural libraries have been successful in empowering their patrons for research and extending knowledge by opening up their local resources, and facilitating easy access to their collections visible globally. On searching a library catalogue patrons can view the recent additions to a library and have experience similar to visiting fresh arrival section in a library. IDEAL has made an encouraging efforts to move from stand alone, physical libraries to web and virtual libraries.

<sup>6</sup> Indian Digital Ensemble of Digital Libraries (IDEAL): a platform of Indian agricultural libraries URL: <http://agricat.egrnth.ac.in/cgi-bin/koha/opac-main.pl> (accessed 14.06.2019).

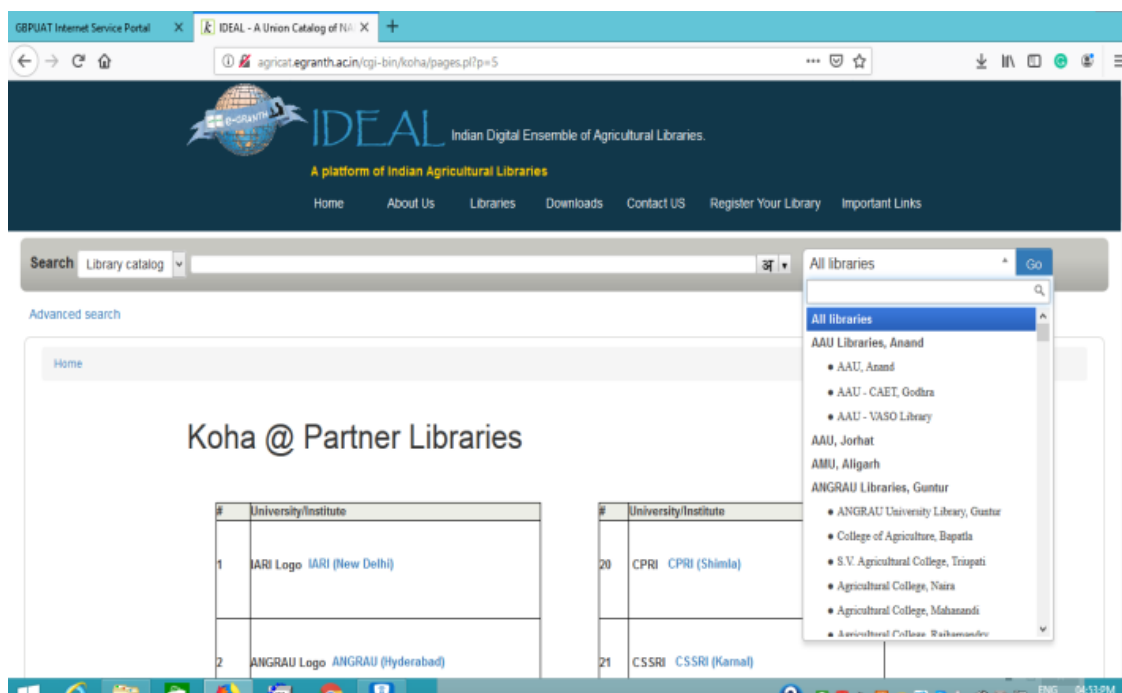


Fig. 1. IDEAL Platform providing access to catalogues  
 Рис. 1. Платформа IDEAL, обеспечивающая доступ к каталогам

### 3. Access to e-Resources through Consortium

CeRA Consortium was established with strong objectives and one of the important goal was to create and popularise e-access culture among the academic community in Agricultural universities and ICAR Research Institutes<sup>7</sup>.

The Indian agricultural libraries are providing research support through CeRA platform, which is a central facility for advancing scientific research and understanding. The consortium, a library of digital resources, was conceived and developed as a sub project – from the National Agricultural Innovative Project in the year 2007, and has been sustained until today. It is expected to continue further to provide access to valuable national and international e-journals/research information in a sustainable way.

It has been noted that subscription to research information by libraries of Agricultural Research Centers and State Agriculture Universities were in decline earlier due to lack of financial resources, moreover, the increase in the cost of international journals/research material had forced many libraries to reduce their subscription which deprived researchers with the current international research information. In order to keep the research and educational activities of the country with international standards and competition it was crucial to make available the latest journals to researchers and teaching community of the NARES.

By providing access to latest research information

<sup>7</sup> About Consortium for e-Resources in Agriculture. CeRA. URL : [http://cera.iari.res.in/attachments/article/19/cera\\_leaflet-2012-FINAL.pdf](http://cera.iari.res.in/attachments/article/19/cera_leaflet-2012-FINAL.pdf) (accessed 27.06.2019).

from leading publishers, CeRA is hoped to evolve a National Academy of Agricultural Sciences (NAAS) rating, to create Science Citation Index facility for evaluation of Indian agricultural scientific publications and to make ICAR institutes and agricultural universities comparable to leading world class institutions.

A consortium mode of acquiring research information was conceived and initiated to outreach the scientific community across all remote locations and to provide online accessibility of latest international published research information from select high-class publishers (like Elsevier, Springer Nature, Taylor & Francis, Annual reviews) in a cost effective way. Under the project CeRA, the central subscription and creation of a web portal called CeRA.Jcc.in opened a new system for successful sharing of resources among the Agricultural research institutes and universities in the country through IP authentication<sup>7</sup>.

CeRA-Jccc (Journal custom content consortium) platform was made functional in 2008 with subscriptions on leading publishers. Indian journals.com etc. is accessible to all ICAR institutes and state universities from a common platform. It is a kind of virtual digital library of e-journal resources customised to provide an electronic gateway to global e-journals including subscribed as well as open access journals. CeRA covers more than 3000 scholarly journals comprising a collection of consortium subscribed journals, library subscribed journals, and open access journals. For easier accessibility most libraries have provided a link to this platform/site on their home page. The content database of consortium journals is quite user friendly for searching. It is searchable

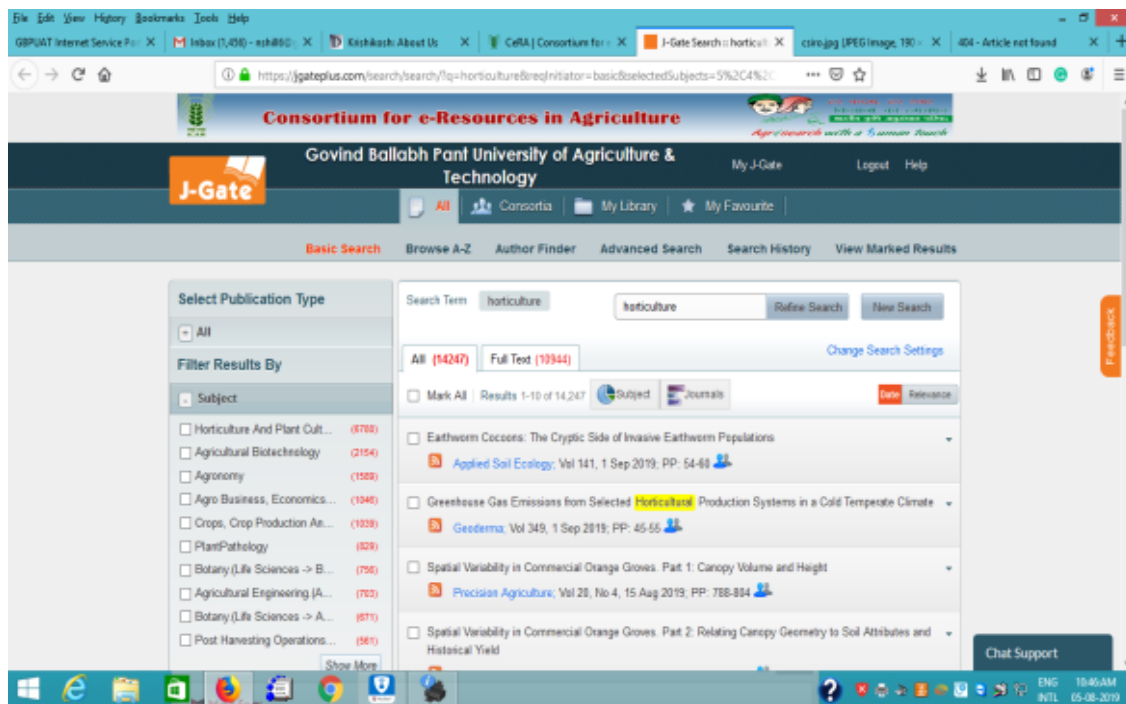


Fig. 2. E-journals through CeRA consortium

Рис. 2. Доступ к электронным журналам через консорциум CeRA

by all popular combinations like author, title, subject categories, keywords etc. (fig. 2). The database provides links to full text articles from both subscribed journals of individual libraries and open access journals and also rolls out document delivery services or interlibrary loan facility.

The consortium resources have grown, a large number of journals have been added during the last years, trial access to new journals is arranged to know the research interests of the academic community and the usage is reviewed annually by Directorate of Knowledge Management, ICAR New Delhi.

#### 4. Consortium Gateway

It would be interesting to have insight about the functioning of the consortium. J-Gate Custom Content for Consortium (JCCC) is a virtual library of e-journal resources or a portal customized for CeRA to provide an electronic gateway to global e-journals accessible everywhere including subscribed as well as open access journals.

The gateway is managed by Informatics India Ltd., Bangalore. Launched in the year 2001, the portal provides seamless access to millions of journals articles available online offered by 13,156 publishers. At present, J-Gate hosts contents from 47,174 e-journals<sup>8</sup> with more than 10,000 journals added almost every day, the site is constantly updated to ensure freshness and reliability of the content. The portal captures and indexes articles from more than 23,706 Open access

e-journals and maintains links to them for expeditious and ready accessibility.

The important features of J-Gate is that it supports online subscription to journals, achieving, Electronic Document Delivery (DDR) and other services related to consortium users, for example, provide access to those journals that are not subscribed by the consortium by including exclusive journals subscribed individually by the consortium member university libraries to promote Inter Library loan or Document Delivery services. J-Gate facilitates a common interface for all the publishers' content subscribed or not subscribed by the consortium precisely J-Gate@ consortia acts as a search platform for the academic community and provides resource sharing facility for the members of the consortium.

The consortium continues to play a key role in research and development activities in NARS. Its aim is to facilitate access to e-journals and to provide a platform for resource sharing through inter library loan of journals subscribed by individual libraries and also to facilitate document delivery to students and research community. Currently, more than 147 Institutions in (NARS) have online access to important selected journals on CeRA platform through IP authentication.

#### 5. A Case Study: The use of consortium resources by G. B. Pant University of Agriculture & Technology (GBPUAT)

G. B. Pant University of agriculture and technology, established in 1960, at Pantnagar in UP state of north of India now Utrakhnad was the first public

<sup>8</sup> CeRA-JGate. URL: <https://jgateplus.com/search/footer-html/AboutUs.jsp> (accessed 28.12.2019).

agricultural university of India. It was based on land grant pattern of American universities. This university plays a significant role in promoting agricultural research, extension and teaching to generate skilled and trained manpower for agricultural services. It was especially important when the country was not self sufficient in food, and the mission of the government was to bring green revolution in the country through the university that had large farm lands. GBPUAT is the largest university in terms of area and campus size. It spreads across 90,000 acre or 360 km<sup>2</sup><sup>9</sup>. The Indian Council of Agricultural Universities has recently ranked it as the third best ICAR Institution and the first Agricultural university in 2018 in the country.

The university's contribution was commended by Norman Borlaug as the "Harbinger of Green Revolution in India" (Pawar, 2008). The university's scientist and research community provided a significant force in development and transfer of high yielding variety seeds and related technology (Ahuja, 1994; Uttar Pradesh..., 1963) to the farmers. G. B. Pant University of Agriculture & Technology, has 7 constituent colleges including college of Basic Sciences, Agriculture, Technology Veterinary, Agri. Business Management and Fisheries Sciences.

The university library is the center of knowledge to GBPUATs academic community. The library stands in its mission to support scholarship and research productivity by providing best available agricultural information and learning resources to support trinity functions of the university i. e. teaching, research, extension or outreach activities. The library works in partnership with the university's academic community to provide access to quality information and to foster scholarship with its extensive resources and services. The library holds nearly 0,426 million collection/volumes and provides access to a number of e-resources, periodical titles, besides books in print and databases (Kumar, 2016).

The library supported the universities mission in early 60's heralding green revolution in the

country and was recognised as a leading research library in agriculture sciences and technology. The library therefore holds a distinctive place in the country.

The university is the member of CeRA consortium ever since the establishment of consortium in 2007.

To evaluate the use of consortium journals from 2014 to 2018 by patrons of G. B. Pant University of Agriculture and Technology, to learn the interests of the university community and to determine the most active months/period that received maximum usage in an academic year an investigation was made.

The data for this study was gathered from Directorate of Knowledge Management (DKMA) New Delhi that manages and funds the consortium resources and Informatics India that manages the online platform. The data was then organised, tabulated and analysed in accordance to the objectives of this study. The study is limited to document request made by patrons of GBPUAT in five years i.e., from 2014 to 2018. The data obtained are presented in the table 1 and in the figure 3.

Although the study is limited to five years data, the findings are very much suggestive of the trends which are important for library profession to understand the patrons interests on use of online platform for accessing e-resources facilitated by the consortium. The analysis of this study is discussed below.

The table 1 reveals that the highest usage of consortium journals was in 2014, i.e. 27% followed by 2015 by 24,83%. Since 2015, a declining trend is noted in the use of e-journals by the academic community of the university. The lowest, less than 8% usage was noted in the year 2018. The not so encouraging pictures of the usage of CeRA journals by the university community could possibly be due to several reasons, most likely they are using other research resources that meets their requirement like open access journals, digital repositories easily accessible through web, subscribed print journals, databases etc. Other reasons could

Table 1. Use of CeRA resources by the university community in 2014–2018

Таблица 1. Использование ресурсов консорциума CeRA сообществом университетов в 2014–2018 гг.

Serial number Номер периодического издания	Year Год	The number of times it was viewed and downloaded Количество просмотров и загрузок	Percentage (%) Процент (%)
1	2014	13,4627	27,56
2	2015	12,1265	24,83
3	2016	11,6493	23,85
4	2017	78,890	16,15
5	2018	37,164	07,61
	<b>Total</b>	<b>48,8439</b>	<b>100</b>

<sup>9</sup> Pantnagar University land not to be transferred any more. NBT.  
URL: <http://navbharattimes.Indiatimes.com/articleshow/13906397.cms> (accessed 16.07.2017).

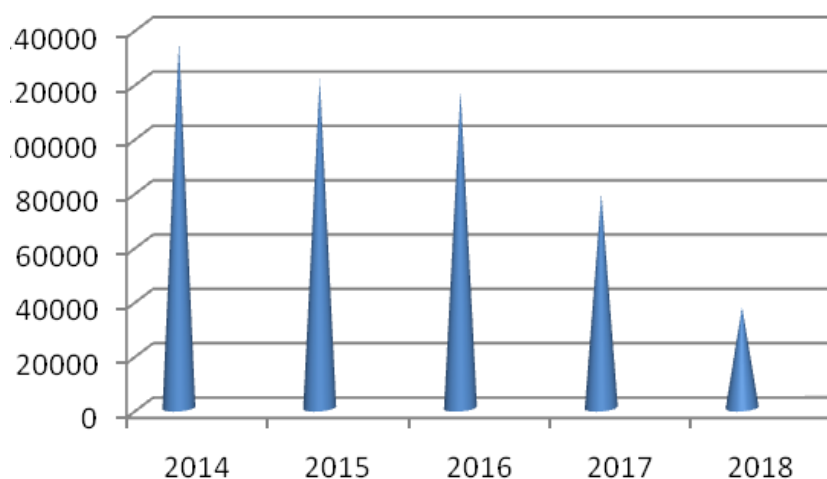


Fig. 3. Usage of consortium e-resources at GBPUAT (Pantvarsity)

Рис. 3. Использование электронных ресурсов консорциума в университете Pantvarsity

be lack of awareness, lack of information literacy or information skills and the need for training the students particularly the post graduate students and research scholars who are largely dependent on journals for their research work and academic assignment, it is likely that patrons are not getting adequate tutoring/guidance to develop skills. The university has high bandwidth internet accessibility in the campus, therefore, network issues can be ruled out. Figure 3 depicts the usage of CeRA e-resources by academic community of Pantvarsity in graph.

The table 2 indicates the period or month wise usage of online research resources or the e-journals made through CeRA platform. It is observed that the highest number of usage were in the month of August, September, January and February as the stu-

dents are most actively involved in submission of their research study for competition of their academic programs. It is noted that while research resources were used throughout the year, the highest usage in 2014 and 2015 were in August (16,96%) and (12,84%) respectively. The years 2016 and 2017 had the highest usage in months of April (12,86%) and February (13,86%) respectively, 2018 also had the highest percentage of research activity in February (15,02%) as indicated by the figures of usage of e-journals. Students submit their research work in the form of dissertation/theses in the months of July–September and also January and February and therefore, are likely to be more active in using the e-journals available through the consortium platform though not totally dependent on these resources.

Table 2. Usage of CeRA Research Resources

Таблица 2. Использование научных ресурсов консорциума CeRA

Sl № п/п	Year Год	2014		2015		2016		2017		2018	
		Month Месяц	Number Число	%	Number Число	%	Number Число	%	Number Число	%	Number Число
1	January	06	0,004	9 266	7,65	13 984	12,00	7 078	8,97	4 164	11,20
2	February	399	0,29	12 144	10,02	12 062	10,36	10 935	13,86	5 583	15,02
3	March	8 653	6,43	10 034	8,28	10 028	8,61	7 741	9,81	3 471	9,34
4	April	20 325	15,09	10 335	8,52	14 978	12,86	6 936	8,79	2 881	7,75
5	May	11 335	8,42	9 496	7,83	12 307	10,57	6 586	8,35	5 021	13,51
6	June	9 114	6,77	7 295	6,02	8 348	7,17	2 777	3,52	2 385	6,42
7	July	6 610	4,91	8 365	6,89	5 407	4,64	3 395	4,31	1 564	4,21
8	August	228 40	16,96	15 570	12,84	10 033	8,61	9 421	11,94	3 551	9,56
9	September	18 466	13,71	11 015	9,09	10 602	9,10	9 307	11,79	3 923	10,55
10	October	8 838	6,65	11 699	9,65	6 416	5,51	4 511	5,72	1 970	05,30
11	November	16 474	12,23	7 100	5,86	7 660	6,58	7 464	9,46	1 180	3,18
12	December	11 567	8,59	8 846	7,30	4 668	4,00	2 739	3,47	1 471	3,96
	Total	134 627	100	121 265	100	116 493	100	78 890	100	37 164	100



The study shows that use of consortium supported research resources/information by the academic community of the university are following a declining trend which is concerning. In order to popularise the use of CeRA platform the library professionals need to work further towards creating more awareness and trainings proactively for both faculty members and graduate students to increase the usage pattern of consortium resources. It is likely, that a number of students and faculty are not aware of this platform and its resources and therefore require greater awareness and hands on training both from publishers of journals included in consortium and library professionals is required. Initiatives like creating posters on consortium resources and lectures are required. The faculty members are also likely to have problems with information overload, insufficient time, information anxiety, or even inadequate technological skills (especially the very senior faculty members) to exploit information sources on their own, therefore, requires greater assistance and short trainings from library professionals from time to time which seems to be inadequate. While research information available through the platform is highly valued in the university system, many patrons including students and faculty, both are unable to exploit or use effectively and are likely be comfortable with print or other easily available e-resources over the web and open access.

It is well acknowledged that research resources that lie outside the domain of the library embedded in platforms can easily be found and accessed by the academic community through the librarians guidance. Therefore, the role of librarians in creating awareness and teaching information skills to exploit these resources is important. The university offers two important courses like “Research methodology” having portion of information sources and “Storage and retrieval of scientific information”, one credit, which is optional for the students to choose from various courses offered to them. These courses can play a significant role in creating awareness as well as knowledge about platforms like CeRA and other e-resources provided all students in the university opt for this course on compulsory basis. The university authorities for post graduate studies and the library

professionals both may have to look into the usage and come up with some interesting and innovative programs to create greater interest among the students and faculty for online resources and platforms.

This study highlights that the use of consortium platform or research resources are encouraging but not so popular among the academic community of Pantvarsity.

## Conclusions

The Indian agricultural libraries have transformed in a remarkable way, various project oriented collaborative union catalogues, online platforms like IDEAL, Krishikosh digital repository, CeRA consortium for research resources have transformed the libraries in a big way and brought information that were physically confined to library premises accessible to the academic community 24×7 across the country and irrespective of locations. These platforms have facilitated and empowered the academic community for research and dissemination of knowledge in digital environment.

The use of CeRA online research resources by the academic community of Pantvarsity though encouraging is in a declining trend, and shows that the researches and academic community is not largely dependent on the platform for research information. There could be several reasons for this, for example having direct access to other sources like open access journals and repositories through popular search engines like Google Scholar, subscribed print journals, resources acquired through inter library loan etc. It is also likely that many patrons are not aware of the platform. The attention of academicians and librarians are required to create greater awareness about the use of these platforms and consortium e-resources and, to look into the impact it makes in agricultural research, also identify barriers faced by academic community, if any, in accessing the resources for a fruitful utilization of online platforms and consortium resources that supports research activities and content creation in agricultural institutions. Further studies are required to know the changing trend.

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