

# Consortium for e-resources in agriculture: qualitative and quantitative perspectives

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*Consortium for e-Resources in Agriculture (CeRA) is the palpable effort of the Indian Council of Agricultural Research to facilitate access to select scientific literature to the academic and research society in the National Agricultural Research System. The consortium provides access to articles from nearly 3000 journals in the broad spectrum of agricultural sciences, including 194 journals in the subjects of animal husbandry, livestock management and poultry sciences; animal nutrition, feed, feed additives and manufacture; dairy technology; fisheries and aquaculture and veterinary science. This article is an attempt to assess the journal collection of CeRA in the above-mentioned subjects. The review status of journals, impact factor, National Academy of Agricultural Sciences rating of scientific journals 2012 (effective from 1 January 2013) and access to archives, are the parameters used for assessment of the journal collection of the consortium.*

**Keywords:** CeRA, consortium, e-journals, impact factor, National Agricultural Research System.

JOURNALS are the core information resources in any discipline. These carriers of nascent information are usually highly priced as compared to other documents. The emergence and applications of Information and Communication Technologies (ICTs) have transformed the publishing and dissemination of information. This has brought a swing in practice of ownership to access to information. Under the influence of ICTs, most of the journal publishers have opted for either only online or online in addition to print versions of their journals. The advantages of e-journals over print counterparts have made these widely popular. The interdisciplinary nature of research, blurring boundaries among subjects, rapid growth in research and developments and ease of publishing, have resulted in proliferation of journals in all disciplines. Chand *et al.*<sup>1</sup> state that 'Number of journals and their costs have increased by three-fold every 15 years, and 226 per cent during the last 20 years in terms of dollars, which may be further compounded by currency conversion, whereas the increase in library budget was only 110 per cent during the same period'<sup>1</sup>. The number of journals and their prices are multiplying, but at the same time, budgets of libraries are shrinking. The 'serial crises'<sup>2</sup> have made it difficult for almost every library to subscribe to all journals relevant for meeting information needs of respective users. To overcome these problems, libraries joined hands to provide information to users in a

cost-effective way; and as an outcome, various consortia of e-journals emerged. The e-journals consortium refers to the co-operative acquisition of access rights for e-journals and databases. Though the library co-operation exists since recognition of libraries as information and knowledge facilitators, the consortium approach has given it a new impetus. 'This new "avatar" of resource sharing has performed like a magic bullet to break the jinx of various constraints in accessing information beyond the financial purview of libraries at the individual level.'<sup>3</sup>

## Consortium growth in India

The growing number of e-journals, their rising prices, increasing number of educational institutions and the problem of financial crunches has led to the evolution of various consortia for e-journals in India. Usually, consortia are intended for meeting information needs of stakeholders in a homogenous group of institutions. The UGC-INFONET Digital Library Consortium, Indian Digital Library in Engineering Science and Technology, National Knowledge Resource Consortium, Consortium for e-Resources in Agriculture, Forum for Resource Sharing in Astronomy and Astrophysics, and Health Science Library and Information Network are the popular consortia.

The consortium approach began in India in 1982 with emergence of the Forum for Resource Sharing in Astronomy and Astrophysics (FORSA). This programme was initiated for sharing resources available in astronomy

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libraries in the nation. In 2004, its membership was extended to physics and mathematics libraries having common interests to carry forward the aims and activities of FORSA<sup>4</sup>.

The UGC-INFONET Digital Library Consortium was launched in December 2003. It facilitates current as well as archival access to more than 7,500 core and peer-reviewed electronic journals and 10 bibliographic databases from world famous publishers, scholarly societies and aggregators. This consortium has been implemented in a phased manner. In the first phase, access to e-resources was offered to 50 universities having internet connectivity under the UGC-INFONET networking program. Hitherto, the consortium access has been extended to 209 universities which are under the purview of UGC. The consortium provides access to e-resources in almost all disciplines including arts, humanities, social sciences, physical sciences, chemical sciences, life sciences, computer sciences, management, mathematics and statistics<sup>5</sup>. The Indian Digital Library in Engineering Science and Technology (INDEST) set up by the Ministry of Human Resource Development, Government of India, facilitates access to e-resources to all the Indian Institutes of Technology (IITs), Indian Institute of Science (IISc) and other institutions including NITs, ISM, IIMs, NITTTRs, etc. Its headquarter is located at IIT Delhi. The consortium facilitates differential access to e-resources to member institutions depending on the nature of their research activity and education<sup>6</sup>.

The National Knowledge Resource Consortium (NKRC) was established in 2009. It is a network of libraries and information centres of 39 National Laboratories and institutes of the Council of Scientific and Industrial Research and 24 institutes of the Department of Science and Technology. The consortium provides access to 5,000+ e-journals from reputed publishers, patents, standards, citation and bibliographic databases<sup>7</sup>. The Health Science Library and Information Network (HELINET) was launched during March 2003. It was established with an aim to improve the quality of education and research in institutions of health sciences in Karnataka, India through enhanced access to high quality medical information. The consortium facilitates access from leading publishers to 600 scholarly, international biomedical journals to members/institutions<sup>8</sup>.

### **Indian Council of Agricultural Research and genesis of CeRA**

India has one of the largest agricultural systems in the world. The Indian Council of Agricultural Research (ICAR) is the apex body regulating agricultural research and education. It is an autonomous body working under the auspices of Department of Agricultural Research and Education, Ministry of Agriculture. The National

Agricultural Research System (NARS) comprises 56 state agricultural universities (including veterinary sciences universities), 4 deemed universities, 48 institutions of national importance, 17 research centres, 6 national bureaus and 24 directorates/project directorates. The ICAR has well-established network connectivity across institutes and state agricultural universities (SAUs) under its annexes, established under the National Agricultural Technology Programme (NATP)<sup>9</sup>. The council proposed to facilitate access to select scientific journals to the academic and scientific society in NARS over the network. Consequently, to implement the proposal, the National Agricultural Innovation Project (NAIP) provided funds for establishing the Consortium for e-Resources in Agriculture (CeRA) at the Indian Agricultural Research Institute (IARI) in 2007. CeRA provides access to articles from nearly 3000 scholarly journals (including consortium-subscribed, library-subscribed and open access journals) in the broad spectrum of agricultural and biological sciences, arts and humanities, basic sciences, biomedical sciences, etc. The consortium provides access to 194 journals in the subjects of animal husbandry, livestock management and poultry sciences; animal nutrition, feed, feed additives and manufacture; dairy technology; fisheries and aquaculture; and veterinary science<sup>10</sup>. The IARI has regularly organized training programmes and workshops to create awareness about the consortium and promote its utilization by the stakeholders.

CeRA is accessible to member institutions through IP authentication. Journals in the consortium can be browsed by title, subject and publisher name. In addition to quick search, the consortium has advanced search option enabling users to refine search using different fields, i.e. by author, keyword, title, author institution, etc. using Boolean Operators. CeRA also has a personalized feature, i.e. 'My Journals'. Under this facility, users can create an account and receive alert mails about the latest issues of selected journals. Besides enabling full-text access to online journals, CeRA provides 'Request the Article' facility under document delivery service (DDS). Under this service, users from consortium member institutions can request and access hardcopies of articles from journals which are being subscribed by other member institutions.

### **Collection development for consortia: the vigorous issue**

The consortium approach has lessened the financial burden on individual libraries and enabled them to facilitate access to vast amount of scholarly literature to stakeholders, cost-effectively. This has overcome problems of space, shelving, mutilation, missing issues, delay in postal delivery, physical maintenance, etc. and hastened the flow of information from originators to end users.

However, development of consortia is not an easy task. It requires considerable initial investments among licensees in terms of infrastructure, staff training and development, networking, etc. The information resources to be accessed through consortia are going to be a lasting impact on academic and research activities of member institutions. Therefore, this aspect needs special attention. The relevance of information resources for meeting the needs of users, currency and subject coverage, access to back issues of journals, etc. need to be considered for successful implementation of consortium initiatives.

The impact factor (IF) is used as one of the quality determinant criteria for journals. This is a measure reflecting the average number of citations to recent articles published in a journal. It is used as a tool to determine the relative importance of a journal within its field; higher the impact factor, more important the journal is thought to be. 'The journal impact factor, as calculated by Thomson Reuters, was originally created as a tool to help librarians identify journals to purchase<sup>11</sup>.' However, IF as a method of assessing the scientific quality of research in an article is under criticism. Vanclay says that 'Although popular in the early 19th century, most scientists now recognize that such measurements offered an inaccurate record of morphology and an unreliable indicator of human behaviour<sup>12</sup>.' According to a London School of Economics and Political Science blog 'Our methods of rewarding research foster an incentive for journal editors to "game" the system, and one in five researchers report being pressured to include citations from the prospective journal before their work is published<sup>13</sup>.' This reflects on how journal editors can themselves manipulate the increase in IF of respective journals. Inter-disciplinary comparison of IF of journals is also not feasible, because in some disciplines (particularly scientific subjects), the IF of journals is very high; whereas in some other disciplines, IF of journals is comparatively low. Despite the criticism and drawbacks, IF is considered a useful method for evaluating quality of journals.

In India, the National Academy of Agricultural Sciences (NAAS) has its own system of rating of scientific literature. The academy 'encourages cutting edge research in different fields of agriculture and accords recognition to scientists by electing them as Fellows, giving them Awards and admitting young scientists to Associateships'<sup>14</sup>. It has designed the process of rating of scientific journals for transparent assessment of published work of the nominees for the Fellowship/Associateship. This rating is popularly known as NAAS rating of scientific journals. To determine rating for the year 2012 (effective from 1 January 2013), the academy has divided journals into two categories, i.e. journals having Thomson Reuters Impact Factor (TRIF) and journals where TRIF is not available. The journals having TRIF are assigned rating between 6.0 and 10.0 based on their IFs. In case of journals where TRIF is not available, the

journals are assigned ranking on the basis of information provided by publishers to the academy.

Access to back volumes of journals is an important issue which needs attention for developing consortia-based collection. Similarly, the review status of a journal is an indicator of the quality of its contents. Peer-reviewed journals are anticipated to be of better quality than journals which are not peer reviewed.

## Methodology

The present study aims at an assessment of the journal collection in subjects such as animal husbandry, livestock management and poultry sciences; animal nutrition, feed, feed additives and manufacture; dairy technology; fisheries and aquaculture; and veterinary science accessible through CeRA. The review status of journals, IF (as per *Journals Citation Report (JCR)* impact factor list 2013)<sup>15</sup>, NAAS rating of journals 2012 (effective from 1 January 2013) and access to archives have been used as parameters for evaluating a journal collection. For the purpose of study, CeRA was accessed during 3–10 November 2013. In case of journals having IF, but no NAAS rating, the scientific rating has been calculated using 'Criteria for NAAS rating for research journals having TRIF'. The terms 'animal husbandry and animal nutrition' have been used throughout the text for animal husbandry, livestock management and poultry sciences; and animal nutrition, feed, feed additives and manufacture respectively.

## Analysis and discussion

The journal collection of CeRA in qualitative and quantitative perspectives is discussed in the following sections.

### *Access to journals*

It is evident from Table 1 that among the five subjects, animal husbandry has highest number of journals accessible through CeRA. This is followed by subjects such as veterinary science and fisheries and aquaculture. Dairy technology has least number of journals accessible through the consortium. Out of 60 journals in animal husbandry, 86.67% is accessible as full text, while remaining 13.33% is accessible via DDS. Similarly, in the subjects of veterinary science, animal nutrition and dairy technology, majority of journals are accessible as full text. Of the journals in fisheries and aquaculture, 56.87% is available as full text, while 43.13% is accessible through DDS.

### *Review status of journals*

Table 2 makes it clear that majority of the journals (69.08%) accessible via consortium are peer reviewed.

**Table 1.** Access to journals

Subjects	Full text	Percentage	Request article	Percentage	Total no. of journals
AHLM&PS	52	86.67	08	13.33	60
ANFFA&M	11	64.70	06	35.30	17
DT	07	63.63	04	36.37	11
F&A	29	56.87	22	43.13	51
VS	42	76.37	13	23.63	55
Total	141	72.68	53	27.31	194

AHLM&PS, Animal husbandry, livestock management and poultry sciences; ANFFA&M, Animal nutrition, feed, feed additives and manufacture; DT, Dairy technology; F&A, Fisheries and aquaculture; VS, Veterinary science.

**Table 2.** Review status of journals

Subject	Peer-reviewed	Percentage	Not peer-reviewed	Percentage	Total no. of journals
AHLM&PS	37	61.67	23	38.33	60
ANFFA&M	11	64.70	06	35.30	17
DT	07	63.63	04	36.37	11
F&A	47	92.16	04	07.84	51
VS	32	58.19	23	41.81	55
Total	134	69.08	60	30.92	194

**Table 3.** Impact factor of journals

Subject	No. of journals having IF	Percentage	No. of journals not having IF	Percentage	Total no. of journals
AHLM&PS	24	40.00	36	60.00	60
ANFFA&M	12	70.59	05	29.41	17
DT	06	54.54	05	45.46	11
F&A	37	72.55	14	27.45	51
VS	26	47.28	29	52.72	55
Total	105	54.12	89	45.88	194

However, in journals in veterinary science and animal husbandry, 41.81% and 38.33% respectively, are not peer reviewed. Proportionately, the subject of fisheries and aquaculture has highest number of peer-reviewed journals.

### *Impact factor of journals*

It is obvious from Table 3 that out of total 194 journals, only a little more than 50% have IF. On the other hand, 45.88% journals have not found place in *JCR* impact factor list 2013. About 72.55% journals in fisheries and aquaculture and 70.59% in animal nutrition have IF. In contrast, majority of journals in animal husbandry (60%) and veterinary science (52.72%) do not have IF.

Table 4 depicts that out of 105 journals, 27.71% have IF between 0.501 and 1.000. About 21.90% of the journals have IF between 1.501 and 2.000, while IF of one-fifth of the journals ranges between 1.001 and 1.500. Only one journal in fisheries and aquaculture has IF above 5. The IF of majority of journals in veterinary science (34.61%) and animal husbandry (29.17%) varies between 0.501 and 1.000. On the other hand, IF of 27.02% of the journals in fisheries and aquaculture lies between 1.501 and 2.000.

Two-thirds of the journals in dairy technology and one-thirds in animal nutrition have IF between 1.001 and 1.501.

### *NAAS rating*

A total of 61.34% of the journals have found place in NAAS rating of scientific journals 2012 (including journals having IF converted to NAAS rating as per criteria given by the Academy) (Table 5). On the other hand, 38.66% of the journals are not mentioned in NAAS rating list. Majority of journals in animal nutrition (82.36%), fisheries and aquaculture (74.51%) and dairy technology (63.63%) have attained NAAS rating. About 51.67% of the journals in animal husbandry and 43.63% in veterinary science do not have NAAS rating.

Table 6 reveals that majority of journals (64.06%) have NAAS rating between 7.1 and 8.0. According to the criteria for calculating NAAS rating of journals having TRIF, journals having IF of 0.60–4.00 are assigned rating between 7.1 and 8.0 at various levels. The NAAS rating of journals having IF between 4.0 and 18.0 ranges between 8.1 and 9.9. Journals with IF greater than 18 are assigned NAAS rating of 10. Around 85.71% of the journals in

## GENERAL ARTICLES

**Table 4.** Impact factor-wise grouping of journals

Subject	0.001– 0.500	0.501– 1.000	1.001– 1.500	1.501– 2.000	2.001– 2.500	2.501– 3.000	3.001– 4.000	4.001– 5.000	> 5	Total no. of journals
AHLM&PS	04 (16.66)	07 (29.17)	05 (20.83)	06 (25.00)	01 (04.17)	01 (04.17)	Nil	Nil	Nil	24 (100%)
ANFFA&M	03 (25.00)	02 (16.67)	04 (33.33)	03 (25.00)	Nil	Nil	Nil	Nil	Nil	12 (100%)
DT	Nil	Nil	04 (66.66)	Nil	01 (16.67)	01 (16.67)	Nil	Nil	Nil	06 (100%)
F&A	04 (10.82)	09 (24.32)	06 (16.21)	10 (27.02)	04 (10.82)	03 (08.11)	Nil	Nil	01 (02.70)	37 (100%)
VS	07 (26.92)	09 (34.61)	02 (07.70)	04 (15.39)	03 (11.54)	Nil	01 (03.84)	Nil	Nil	26 (100%)
Total	18 (17.14)	27 (25.71)	21 (20.00)	23 (21.90)	09 (08.58)	05 (04.77)	01 (00.95)	Nil	01 (00.95)	105 (100.00)

**Table 5.** NAAS rating of journals

Subject	Yes	Percentage	No	Percentage	Total no. of journals
AHLM&PS	29	48.33	31	51.67	60
ANFFA&M	14	82.36	03	17.64	17
DT	07	63.63	04	36.37	11
F&A	38	74.51	13	25.49	51
VS	31	56.37	24	43.63	55
Total	119	61.34	75	38.66	194

**Table 6.** NAAS rating-wise grouping of journals

Subject	< 4.0	4.1–5.0	5.1–6.0	6.1–7.0	7.1–8.0	8.1–9.0	9.1–10.0	Total no. of journals
AHLM&PS	02 (06.90)	03 (10.34)	Nil	05 (17.24)	19 (65.52)	Nil	Nil	29
ANFFA&M	Nil	02 (14.29)	Nil	03 (21.42)	09 (64.29)	Nil	Nil	14
DT	01 (14.29)	Nil	Nil	Nil	06 (85.71)	Nil	Nil	07
F&A	01 (02.63)	Nil	Nil	04 (10.53)	32 (84.21)	01 (02.63)	Nil	38
VS	04 (12.91)	01 (03.22)	Nil	10 (32.26)	15 (48.39)	01 (03.22)	Nil	31
Total	08 (06.72)	06 (05.04)	Nil	22 (18.49)	81 (64.06)	02 (01.69)	Nil	119 (100.00)

**Table 7.** Archival access to journals

Subject	1–5	6–10	11–15	16–20	21–25	>25	Total no. of journals
AHLM&PS	08 (13.33)	15 (25.00)	21 (35.00)	11 (18.34)	Nil	05 (08.33)	60
ANFFA&M	05 (29.41)	02 (11.77)	06 (35.29)	04 (23.53)	Nil	Nil	17
DT	06 (54.54)	02 (18.18)	03 (27.28)	Nil	Nil	Nil	11
F&A	12 (23.53)	11 (21.57)	12 (23.53)	12 (23.53)	04 (07.84)	Nil	51
VS	07 (12.73)	17 (30.91)	21 (38.19)	08 (14.55)	01 (01.81)	01 (01.81)	55
Total	38 (19.59)	47 (24.22)	63 (32.48)	35 (18.04)	05 (02.58)	06 (3.09)	194 (100.00)

dairy technology, 84.21% in fisheries and aquaculture, 65.52% in animal husbandry and 64.29% in animal nutrition have NAAS rating between 7.1 and 8.0. One journal each in fisheries and aquaculture and veterinary science have NAAS rating between 8.1 and 9.0.

### Archival access to journals

It is clear from Table 7 that nearly one-third of the journals facilitate access to back volumes for 11–15 years. About 24.22% of the journals provide archival access for 6–10 years and 19.59% give access to back volumes for less than 5 years. A few journals provide archival access for more than 25 years. Majority of journals in veterinary science (38.19%), animal nutrition (35.29%) and animal husbandry (35%) provide archival access for 11–15 years. On the other hand, majority of the journals in dairy technology offer access to back volumes for 1–5 years only.

### Findings of the study

Major findings of the study are as follows.

1. Among the five subjects, animal husbandry, livestock management and poultry sciences has highest number of journals while dairy technology has least number of journals accessible through CeRA.
2. Nearly 73% of journals in all subjects are available in full text. In the subject of animal husbandry, 86.67% of journals are accessible in full text. However, in the subject of fisheries and aquaculture, 56.87% of journals are available in full text.
3. About 69% of journals accessible via consortia are peer reviewed. Proportionately, the subject of fisheries and aquaculture has highest number of peer-reviewed journals.
4. Out of 194 journals, 54.12% have IF, whereas remaining 45.88% do not have IF. Majority of journals in

fisheries and aquaculture (72.55%) and animal nutrition (70.59%) have IF; while 60% of journals in animal husbandry and 52.72% in veterinary science do not have IF.

5. Majority of journals have IF between 0.501 and 1.000. Except a journal in fisheries and aquaculture, none of the journals in the five subjects have IF above 4.
6. In total, 61.34% of journals have NAAS rating (including journals having IF converted to NAAS rating). Around 82% of journals in animal nutrition, 71.51% in fisheries and aquaculture, 63.63% in dairy technology and 56.37% in veterinary science have NAAS rating. On the other hand, 51.67% of journals in animal husbandry do not have place in NAAS rating of scientific journals 2012.
7. Nearly 64% of journals have NAAS rating between 7.1 and 8.0. About 86% of journals in dairy technology, 84.21% in fisheries and aquaculture, 65.52% in animal husbandry and 64.29% in animal nutrition have NAAS rating between 7.1 and 8.0.
8. None of the journals in the five subjects accessible through CeRA have top NAAS rating, i.e. 10.
9. Majority of journals (32.48%) provide access to back volumes for 11–15 years. Nearly one-fourth of the journals offer archival access for 6–10 years. Around 54% of journals in dairy technology provide access to back volumes up to 5 years only.

## Conclusions

The journal collection of CeRA in animal husbandry, livestock management and poultry sciences; animal nutrition, feed, feed additives and manufacture; dairy technology; fisheries and aquaculture; and veterinary science is expected to be a strategic source of information for meeting needs of stakeholders in veterinary universities and concerned institutions. The study reveals that though the subject of animal husbandry, livestock management and poultry sciences has the highest number of journals accessible through the consortium, majority of these neither have IF nor NAAS rating. Around 38% of these are not even peer reviewed. The position of journal collection in veterinary science has also not improved. The subject of fisheries and aquaculture has highest number of journals which are peer reviewed and have IF. Though TRIF has much criticism as a quality determinant for journals, it is a significant tool for librarians to decide about journal subscription. On the basis of parameters used for assessment of CeRA, journal collection in animal nutrition, feed, feed additives and manufacture; and fisheries and aquaculture, appears to be more qualitative than other subjects. Though majority of journals in dairy technology accessible via CeRA are peer reviewed, have IF and NAAS rating, the number of journals is too meagre to make any generalization. Majority of journals in CeRA provide archival access for 11–15 years. However, while

calculating the archival access to journals, it was observed that subscription to current issues of many of these has not been updated. The journal collection of CeRA is developed on the basis of recommendations of universities and institutions in NARS. This mechanism of subscription for journals supported by decisions based on IF, NAAS rating of journals and review status can strengthen the consortium in fulfilling information needs of stakeholders in one of the world's largest agricultural system.

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