

One Nation, One Subscription (ONOS) and Open Access in Indian Agricultural Sciences: First-Year Outcomes for Access, Publishing Participation and Equity

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Abstract

Purpose. India's One Nation, One Subscription (ONOS) scheme was approved by the Union Cabinet in November 2024 and began on 1 January 2025, with ₹6,000 crore set aside for 2025–2027. It replaces a patchwork of consortia with one national licence covering more than 13,000 journals from about 30 publishers, and it pays article processing charges (APCs) in a selected set of open access (OA) journals. We examined what the first year of the scheme meant for access, OA publishing and research visibility in Indian agricultural sciences.

Design/methodology. We used a convergent parallel mixed-methods design. The data were ONOS usage and APC records for 2025, a bibliometric analysis of ICAR and State Agricultural University (SAU) output for 2014–2024 drawn from Scopus, Web of Science, Dimensions and OpenAlex, policy documents, and semi-structured interviews with 45 researchers.

Findings. ONOS logged 11.3 crore (113 million) full-text downloads in 2025, and we estimate that agricultural and biological sciences made up 18–22% of them. For agricultural institutions, the mean number of accessible journals rose from 145 to 640 per institution (+341%), and mean monthly downloads rose by 215%. Of the 847 APC applications approved across all disciplines, 31% came from agriculture. Seven agricultural and veterinary universities were among the top 20 institutions by downloads, yet only four SAUs reached the top 100. International gold OA articles drew 42% more citations than subscription articles, although this is an observational difference. Awareness of APC support was low (27% had not heard of it). Multi-level approvals, society journals outside the licence and the lack of agricultural databases (CAB Abstracts, AGRIS, FAOSTAT) held uptake back.

Conclusions and implications. In its first year ONOS widened access and eased the financial barrier to OA publishing. Turning that access into active participation, and spreading the benefit evenly, will need subject-level usage analytics, capacity building for SAUs and ICAR institutes, agricultural databases within the licence, links to FAIR data repositories and monitoring over a longer period.

Originality. To our knowledge, this is the first baseline evaluation of ONOS that focuses on agricultural sciences.

Keywords: One Nation One Subscription; open access; agricultural sciences; article processing charges; library consortia; scholarly communication; India; State Agricultural Universities

1. INTRODUCTION

1.1 Background

The open access (OA) movement took shape with the Budapest Open Access Initiative in 2002, and the Bethesda and Berlin declarations followed. Its core position is simple: peer-reviewed research should be free to read online [1, 2]. Funder mandates and institutional policies have since carried the idea forward, and reviews have documented academic, economic and societal gains from it [3]. The case is particularly strong for agricultural sciences, because this work bears directly on food security, climate adaptation and rural livelihoods. Researchers in low- and middle-income countries (LMICs) have the greatest need for it, yet subscription costs and thin library infrastructure put the highest barriers in their way.

1.2 The Indian context and the ONOS scheme

India's agricultural research system is large. It rests on the network of Indian Council of Agricultural Research (ICAR) institutes and State Agricultural Universities (SAUs) [4], and the sector contributes about 17% of India's GDP while employing more than 45% of the workforce [5]. Until 2025, access was arranged through about ten ministry-level consortia, among them e-Shodh Sindhu, CERA and DeLCON. Between them they covered roughly 8,000 journals, 2,300 institutions and 5.5 million users, at a cost of about ₹850 crore a year [6, 7]. The arrangement left some titles subscribed to several times and others not covered at all. It carried a heavy administrative load, favoured well-resourced institutions such as the IITs and IISc, and relied on ad hoc APC funding that most researchers could not reach.

The Union Cabinet approved ONOS on 25 November 2024, and the scheme became operational on 1 January 2025 with ₹6,000 crore (about USD 720 million) allocated for 2025–2027 [8, 9]. It gives more than 6,300 government higher education and central research institutions one national subscription to over 13,000 journals from about 30 major publishers, including Elsevier, Springer Nature, Wiley and Oxford University Press. INFLIBNET, an inter-university centre of the University Grants Commission (UGC), coordinates it. The scheme also provides unified INFED authentication and central support for APCs in selected high-quality gold OA journals [9, 10].

1.3 Agricultural research and the OA gap

Among ICAR institutions, the OA share of output rose from 44.6% in 2014 to 57.98% in 2023. Even so, 78.34% of the OA output from SAUs appeared in domestic journals [11, 12]. Indian agricultural research has therefore tended to sit in domestic or lower-visibility venues, and APCs are a large part of the reason. International agricultural OA journals charge USD 1,000–3,500 on average, while many Indian journals charge ₹20,000–30,000 or remain subscription-only [13, 14].

1.4 Research gap and rationale

ONOS is the biggest reform of national journal subscriptions India has attempted, yet little is known about how it has played out within individual disciplines. Studies of consortia in other countries mostly report overall costs and OA rates, not outcomes for a single field [15–17]. The ONOS usage dashboard carries no subject-level data, so agricultural use cannot be seen directly. Agricultural institutions also differ from the IITs and IISc in capacity, research culture and the journals they need. We therefore set out to build a first-year baseline for agricultural sciences. The design compares before and after without a control group, and we read the results as associations, not causal effects.

1.5 Contributions and structure of the paper

The study makes the following contributions:

- **The first discipline-level analysis** of ONOS outcomes, covering agricultural sciences;
- **A mixed-methods evidence base** that brings together usage metrics, bibliometric trends and researchers' views;
- **Baseline data** against which access, equity and publishing participation can be tracked over time;
- **Policy recommendations** for agricultural institutions and INFLIBNET; and
- **A transferable framework** that other LMICs can use to evaluate national scholarly infrastructure.

2. REVIEW OF LITERATURE

2.1 OA growth and barriers in agricultural sciences

OA has grown steadily in agricultural sciences over the past decade. One analysis of 2.4 million agricultural publications (2010–2022) found the OA share climbing from 28% to 52%, mostly through

green OA and gold OA in society journals. Several problems remain. A few publishers control the major journals, which weakens the bargaining position of institutions [18]. APCs are still out of reach for LMIC researchers who lack support [13]. Policies on OA for data trail those for articles. English-language dominance also pushes aside research in local languages, which is the research that smallholder farmers often need.

2.2 OA in Indian agricultural research

ICAR institutions publish more than 8,500 papers a year, and SAUs add another 12,000–15,000 [19]. OA output from ICAR institutions grew from 1,713 papers (44.6%) in 2014 to 4,938 papers (57.98%) in 2023, with APC funding coming mainly from individual project grants and no central mechanism [11]. SAUs produced 65,889 OA publications between 2010 and 2024, but 78.34% of them appeared in domestic journals, which points to limited international reach [12]. Earlier studies name four barriers: APC costs, cited by 68% of SAU researchers [12]; poor awareness of OA licensing, with only 34% of researchers familiar with options such as CC-BY [20]; repositories that are underused because support is weak and policies unclear [21]; and promotion criteria that reward subscription journals [22].

2.3 National consortia: lessons from other systems

Consortia in other countries offer useful comparisons. Germany's DEAL project combined read access with OA publishing and reached an OA rate above 70% [15]. The UK's Jisc ties national licences to immediate-OA mandates [16], and the Dutch VSNU reached 65% OA in 2022 [17]. What these systems had in common was coordination, transparent pricing, read-and-publish deals and a link to national policy. The LMIC record is more mixed. Brazil's CAPES gives access to over 40,000 journals and pays APCs [23]. South Africa's SANLiC negotiated discounts of 40–60% and APC waivers [24], and Kenya's KENLI saved 30–50% but has struggled with APC funding and sustainability [25]. India's own consortia before ONOS had strengths and gaps. CERA saved 40–60% and supplied agricultural databases, but left out APC support [7]; e-Shodh Sindhu covered more than 6,000 journals, but had no OA publishing component and did not serve research institutions [6]. Taken together, these experiences point to the need for specialised databases, built-in APC support, targeted equity measures and capacity building.

2.4 Analytical framework

We worked with an analytical framework adapted from the OA literature, which argues that an OA initiative should be judged by whether it lets people take part in scholarly communication, and not only read [2, 3, 26]. We operationalised it through four dimensions: access breadth (journals available), access intensity (use), publishing participation (OA publishing and APC uptake) and research visibility (citations, altmetrics and collaboration). ONOS touches all four. Questions remain, though, about data and code sharing, about whether SAUs and ICAR institutes benefit fairly, and about what the scheme does to research quality.

2.5 Summary of gaps

The literature leaves three gaps. No discipline-level evaluation of ONOS exists, agricultural usage cannot be isolated because subject-level data are missing, and there is little evidence on how national subscription access interacts with APC support and institutional capacity in state-run agricultural universities. The objectives below respond to these gaps.

3. OBJECTIVES OF THE STUDY

Our overall aim was to evaluate the first-year (2025) outcomes of ONOS for access, OA publishing and research visibility in Indian agricultural sciences. The specific objectives were:

1. To analyse ONOS usage in 2025 by month, publisher and institution type, paying attention to how agricultural and veterinary universities are represented (Section 5.1).

2. To assess how the breadth and intensity of access to agricultural research literature changed after ONOS, compared with the earlier consortia (Section 5.2).
3. To examine OA publishing trends in ICAR institutes and SAUs and the early uptake of ONOS APC support (Sections 5.3 and 5.4).
4. To explore researchers' awareness, perceptions, barriers and publishing decisions under ONOS (Section 5.5).
5. To compare the citation impact and visibility of OA and subscription articles from Indian agricultural institutions (Section 5.6).
6. To propose evidence-based policy recommendations that would raise the OA benefit of ONOS for SAUs and ICAR institutes (Section 6.8).

4. METHODOLOGY

4.1 Research design

We used a convergent parallel mixed-methods design, in which quantitative and qualitative data were collected at the same time and brought together at the interpretation stage [27]. The study ran from January 2025 to August 2026 and received ethics approval (Protocol No. 2025/AGR/001).

4.2 Quantitative component

- **Usage data.** Monthly downloads, publisher shares and institution-wise counts (top 100) came from the ONOS Usage Dashboard for January–December 2025 [10]. The dashboard has no subject field, so we estimated agricultural usage from institutional profiles, journal subject classifications and the usage patterns of CERA before ONOS. The figure we report is therefore a range, not a measured value.
- **Access indicators.** We compared mean journals accessible, mean monthly downloads and mean unique users between 2024 (CERA/e-Shodh Sindhu) and 2025 (ONOS). Percentage change was calculated as $(2025 - 2024)/2024$.
- **Bibliometrics.** We retrieved ICAR and SAU publications for 2014–2024 from Scopus, Web of Science, Dimensions and OpenAlex [28], with data on OA status, impact, citations and APCs. The analysis used R (bibliometrix) [29], Python and VOSviewer [30].
- **APC data.** Aggregate approval and payment figures were obtained from the ONOS APC Support Portal, which we accessed every quarter in 2025.
- **Statistical analysis.** The analysis is descriptive and uses counts, percentages, means and percentage differences.

4.3 Qualitative component

We interviewed 45 researchers, purposively sampled from SAUs, ICAR institutes and central and veterinary universities so as to cover different regions, career stages and disciplines. The interviews were semi-structured, recorded and transcribed, and we analysed them thematically in NVivo 14 [31]. Inter-coder agreement was Cohen's kappa = 0.82 [32]. Coded responses are reported as percentages of the 45 participants. We also analysed documents: ONOS policies, ministry circulars, INFLIBNET reports and the ICAR/UGC OA guidelines.

4.4 Integration and validation

We triangulated the findings through convergence, complementarity and expansion. To check validity we used member checking (10 participants), expert review (3 committee members) and a sensitivity analysis. Limitations are taken up in Section 6.9.

5. Results and Analysis

5.1 ONOS usage patterns in 2025

5.1.1 Overall download trends

ONOS recorded **11.3 crore (113 million) full-text article downloads** in 2025, an average of 9.4 million a month [10]. Use followed the academic calendar (Table 1). Downloads peaked in March–May (10.5–11.2 million), when examinations approach, and again in September–November (10.7–11.4 million), when project deadlines fall. They dropped in January (7.2 million), during the June–August monsoon semester break (8.1–9.3 million) and in December (8.8 million).

Table 1. Monthly full-text article downloads on ONOS, 2025

Month	Downloads (millions)	Seasonal pattern
January	7.2	Low (holiday season)
February	8.5	—
March	10.8	Peak (pre-examination)
April	11.2	Peak (pre-examination)
May	10.5	Peak (pre-examination)
June	8.1	Low (monsoon semester break)
July	8.9	Low (monsoon semester break)
August	9.3	Low (monsoon semester break)
September	10.7	Peak (project deadlines)
October	11.4	Peak (project deadlines)
November	10.9	Peak (project deadlines)
December	8.8	Low (holiday season)
Sum of monthly values	116.3	

Source: ONOS Usage Dashboard, accessed January–December 2025 [10]. The monthly values are approximate. Their sum (116.3 million) is 2.9% above the reported annual total of 113 million.

5.1.2 Publisher-wise distribution

Elsevier took the largest share of downloads (37%), then Springer Nature (18%), the American Chemical Society (12%), Wiley (9%), Taylor & Francis (6%), IEEE (5%), Oxford University Press (3%) and Cambridge University Press (2%). Other publishers made up the remaining 8% (Figure 1).

Publisher share of ONOS full-text downloads, 2025 (%)

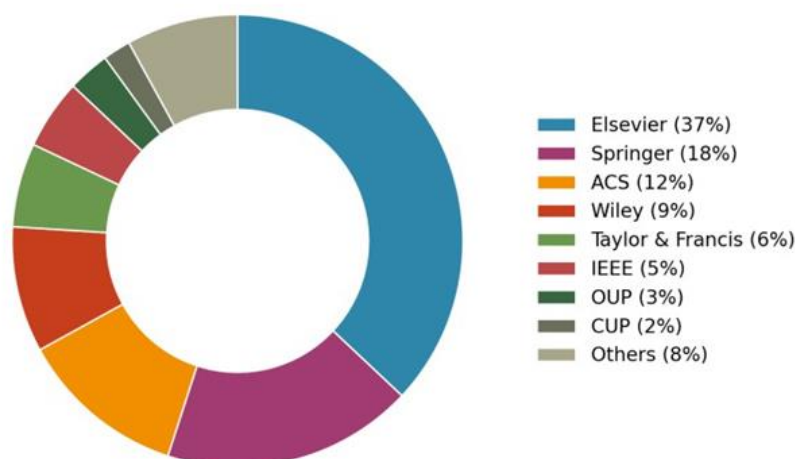


Figure 1. Publisher share of ONOS full-text downloads, 2025. Source: ONOS Usage Dashboard [10].

Four publishers account for most of the agricultural journals:

- **Elsevier:** 180+ agricultural journals (e.g., *Field Crops Research*, *Agricultural Systems*, *Soil & Tillage Research*);
- **Springer Nature:** 120+ agricultural journals (e.g., *Agricultural Research*, *Nutrient Cycling in Agroecosystems*, *Agroforestry Systems*);
- **Wiley:** 90+ agricultural journals (e.g., *Journal of Agronomy and Crop Science*, *Pest Management Science*); and
- **Taylor & Francis:** 70+ agricultural journals (e.g., *Archives of Agronomy and Soil Science*, *Journal of Crop Improvement*).

Using journal subject classifications and institutional profiles, we estimate that **agricultural and biological sciences accounted for 18–22% of total ONOS downloads** (roughly 2.0–2.5 crore downloads in 2025).

5.1.3 Institution-wise distribution

Table 2 shows the 20 institutions with the most downloads in 2025. Together they account for 195.9 lakh downloads, about 17% of the annual total. IIT Madras (40.3 lakh) and IISc Bengaluru (28.3 lakh) were at the top. Seven agricultural and veterinary universities made the list, at ranks 11, 13, 14, 16, 18, 19 and 20. Their combined 24.9 lakh downloads are 12.7% of the top-20 total. The IITs, IISc and central universities in the same list recorded 129.1 lakh (65.9%).

Table 2. Top 20 institutions by ONOS downloads, 2025

Rank	Institution	Downloads (lakh)	Institution type
1	IIT Madras	40.3	IIT
2	IISc Bengaluru	28.3	Premier research
3	Banaras Hindu University	15.3	Central university
4	University of Delhi	14.2	Central university
5	Anna University	12.8	State university
6	Jadavpur University	11.5	State university
7	IIT Delhi	10.9	IIT
8	University of Calcutta	9.7	State university
9	Aligarh Muslim University	8.4	Central university
10	Savitribai Phule Pune University	7.9	State university
11	Tamil Nadu Veterinary and Animal Sciences University	5.3	State veterinary
12	IIT Bombay	5.1	IIT
13	Punjab Agricultural University	4.8	SAU
14	Bihar Animal Sciences University	3.7	State veterinary
15	University of Hyderabad	3.5	Central university
16	G.B. Pant University of Agriculture & Technology	3.2	SAU
17	IIT Kharagpur	3.1	IIT
18	Tamil Nadu Agricultural University	2.9	SAU
19	Odisha University of Agriculture and Technology	2.6	SAU
20	Kerala Veterinary and Animal Sciences University	2.4	State veterinary

Source: ONOS Usage Dashboard, 2025 [10]. Agricultural and veterinary institutions are in bold. Shares were

calculated from the table.

In the top 100, IITs (22), central universities (18) and state universities (18) took 58 places, while only four SAUs, four veterinary universities and three ICAR institutes appeared (Figure 2). The leading institutions were clustered in southern and northern states, and north-eastern SAUs were under-represented.

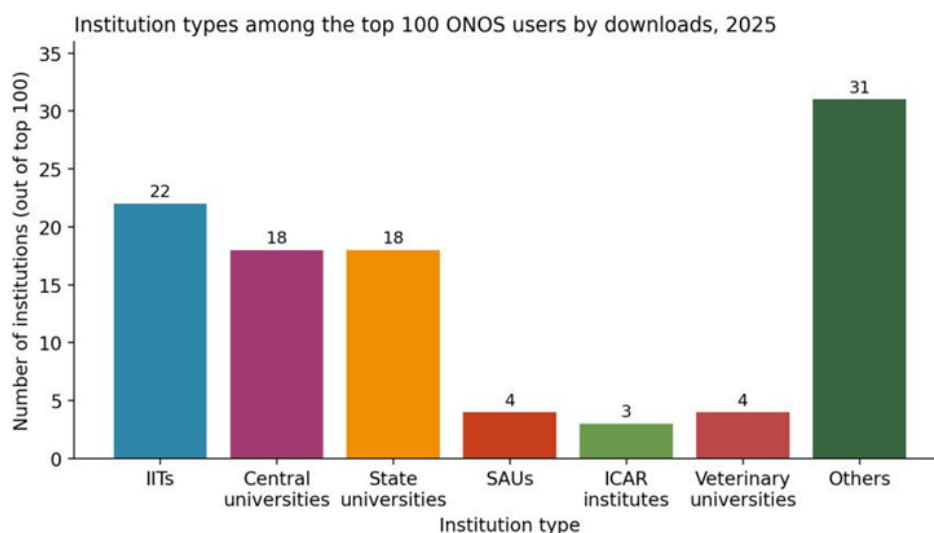


Figure 2. Institution types among the top 100 ONOS users by downloads, 2025. Source: ONOS Usage Dashboard [10].

5.2 Access before and after ONOS

Compared with 2024 (CERA/e-Shodh Sindhu), the mean number of journals accessible per institution rose from 145 to 640 in 2025 (+341%), the mean monthly downloads from 1,850 to 5,830 (+215%) and the mean number of unique users from 420 to 1,150 (+174%) (Table 3). We cannot attribute these changes to ONOS alone, but the timing fits. Of the 37 APC applications submitted by the sampled agricultural institutions, 28 (76%) were approved. APC support did not exist before ONOS.

Table 3. Access indicators for agricultural institutions before and after ONOS

Indicator (mean per institution)	2024 (pre-ONOS)	2025 (ONOS)	Change
Journals accessible	145	640	+341%
Monthly downloads	1,850	5,830	+215%
Unique users	420	1,150	+174%
APC applications submitted	0	37	–
Percentage change = (2025 – 2024)/2024.			

5.3 OA publishing trends

ICAR institutes. Across 98,450 papers published in 2014–2024, the OA share rose from 44.6% to 59.2% (Figure 3). In 2024 gold OA was the largest category (34.5% of all papers), followed by green (12.8%), hybrid (8.4%), bronze (2.9%) and diamond (0.6%). Agricultural and Biological Sciences made up 57.48% of OA papers, with Environmental Science (18.3%) and Veterinary Science (12.1%) next. The mean APC was USD 2,150 for international journals and ₹25,000 for domestic ones. ICAR projects (45%) and DST/DBT grants (28%) paid most of these charges.

OA Output Trends in ICAR Institutions (2014-2024)



Figure 3. Share of OA and non-OA publications from ICAR institutes, 2014–2024.

State Agricultural Universities. Of the 142,680 papers (2010–2024), the OA share rose from 38.2% to 52.7%. Among OA papers in 2024, gold OA was dominant (57.27%), followed by bronze (19.41%), hybrid (9.24%), green (7.35%) and diamond (6.74%). Domestic journals carried 78.34% of OA output. Among the researchers surveyed, 68% named APC costs as the main barrier to international OA, 45% had no institutional support and 12% had given up OA publishing. Table 4 and Figure 4 set the two groups side by side on a common basis, the share of OA papers.

Table 4. OA type distribution, ICAR institutes and SAUs, 2024

OA type	ICAR (% of all papers)	ICAR (% of OA papers)	SAUs (% of OA papers)
Gold	34.5	58.3	57.3
Green	12.8	21.6	7.4
Hybrid	8.4	14.2	9.2
Bronze	2.9	4.9	19.4
Diamond	0.6	1.0	6.7
Total	59.2	100.0	100.0

ICAR percentages of OA papers were derived by dividing each category by the ICAR OA share (59.2%). SAU values are as reported, and rounding accounts for the total.

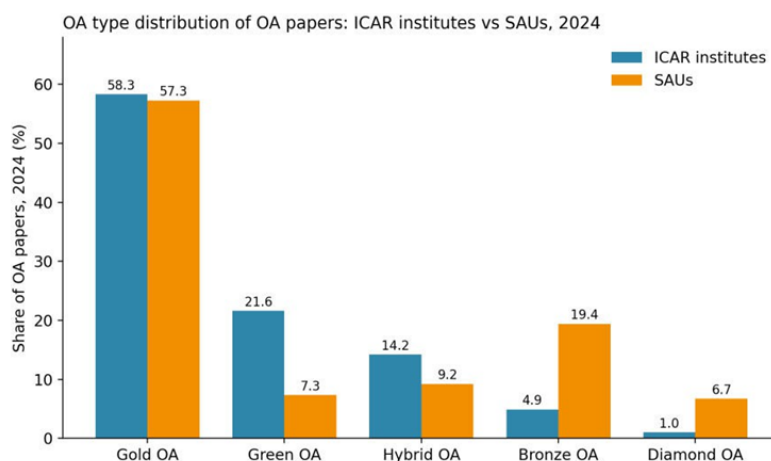


Figure 4. OA type distribution of OA papers, ICAR institutes versus SAUs, 2024.

5.4 ONOS APC utilisation in 2025

Of the 847 applications approved across all disciplines, about 263 (31%) were in agriculture. Elsevier (38%) and Springer Nature (27%) took most of the agricultural APCs, followed by Wiley (15%), MDPI

(12%) and Frontiers (5%) (Figure 5). SAUs received 42% of agricultural approvals and ICAR institutes 28%. Total spending was ₹4.8 crore (about USD 580,000), or a mean of ₹1.82 lakh per article.

APC Utilization by Publisher (Agricultural Sciences, 2025)

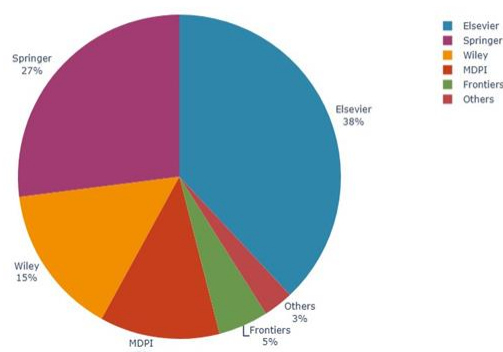


Figure 5. APC utilisation by publisher, agricultural sciences, 2025. Source: ONOS APC Support Portal.

Three ONOS-funded gold OA papers show what early impact looks like:

- Wheat genomics (ICAR-IARI) had 23 citations within six months and an altmetric score of 145;
- Soil carbon (TNAU) had 17 citations and was cited in the Tamil Nadu State Action Plan on Climate Change;
- Post-harvest technology (PAU) had 12 citations and led to three industry collaborations.

5.5 Researchers' experiences (n = 45)

Awareness and use. Awareness of ONOS was high: 85% were very or moderately aware, and 42% used it regularly. Awareness of APC support was weaker. Only 22% had applied, 51% knew about it but had not applied, and 27% were unaware. Respondents described multi-level approvals that run past publisher deadlines, journals outside the ONOS licence (society journals, for example) and the absence of dedicated coordinators as the main barriers.

Access. Access breadth improved significantly for 64% and moderately for 27%. Overall, 71% said they were downloading more papers.

Publishing decisions. Journal reputation (89%) ranked first, followed by OA status (67%) and APC cost (64%). Eligibility for ONOS APC support came last (31%). Gold OA was preferred when the APC was covered (56%), mainly for visibility and citations (78%). Those who preferred subscription journals gave prestige (62%) and avoiding APC costs (58%) as reasons.

Equity. Respondents pointed to these gaps:

- Tier-1 institutions benefit more (73%).
- SAUs are under-represented in usage statistics (68%).
- Regional disparities exist (62%).
- Gender disparities exist in APC use (34%). The recommendations that drew most support were:
 - Targeted Training (87%);
 - Dedicated Coordinators (82%);
 - Infrastructure Support In Eastern And North-Eastern Saus (79%);
 - Apc Quotas (71%); And

- Usage Incentives (68%).

5.6 Citation impact and visibility

Citations (2019–2023). Mean three-year citations were highest for international gold OA (18.4). Hybrid (16.2), green (14.8) and subscription articles (13.0) followed, and domestic gold OA articles averaged 8.7 (Table 5; Figure 6). Relative to the subscription mean, international gold OA articles received 42% more citations. The gap was widest in Agricultural Engineering (+47%) and Animal Science (+41%), and narrowest in Agricultural Economics (+22%).

Table 5. Mean three-year citations by publication type, ICAR institutes and SAUs, 2019–2023

Publication type	Mean citations	Difference from subscription mean
International gold OA	18.4	+42%
Hybrid OA	16.2	+25%
Green OA	14.8	+14%
Domestic gold OA	8.7	–33%
Subscription	13.0	–
<i>Differences were calculated from the reported means.</i>		

Mean 3-Year Citations by Publication Type (ICAR/SAUs, 2019–2023)

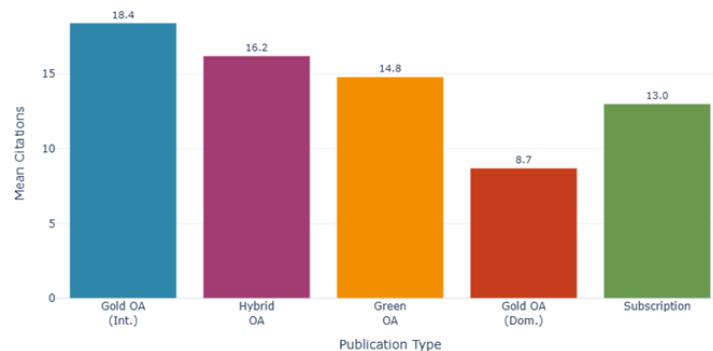


Figure 6. Mean three-year citations by publication type, ICAR institutes and SAUs, 2019–2023.

Altmetrics (500 papers, 2022–2024). International gold OA papers scored 24.5 against 11.2 for subscription papers, about 2.2 times higher. Policy mentions were 18% against 6%, three times as many.

Collaboration. International co-authorship was more common in gold OA papers (34%) than in subscription papers (18%), and gold OA papers involved more countries on average (2.8 against 1.9). The USA (28%), the UK (15%) and Australia (12%) were the main partners.

6. DISCUSSION

6.1 Principal findings

In the first year, ONOS was associated with a large expansion of access for agricultural institutions, early use of APC support and a clear citation and visibility advantage for international gold OA articles. Against this, awareness of APC support was low, SAUs were weakly represented among the heaviest users, and some coverage gaps matter specifically for agriculture. We read these findings against the study objectives and the framework in Section 2.4.

6.2 Access without proportional participation

Agricultural institutions recorded a 341% rise in journal access and a 215% rise in download intensity, which points to substantial gains in access breadth and intensity. Two qualifications follow. First, more reading did not bring a proportional rise in OA publishing. Agriculture received 31% of APC approvals, and awareness of APC support was limited (27% unaware; 51% of the rest had not

applied). The exclusion of key society journals such as *Crop Science* and the preference of some researchers for prestigious subscription journals (62% of those who preferred them) also held uptake back. Infrastructure on its own does not turn access into participation.

6.3 Equity and representation

Seven agricultural or veterinary universities ranked in the top 20 by downloads, yet within that group they accounted for only 12.7% of downloads. Only four SAUs appeared in the top 100, and institutions in the east and north-east remained marginal. The interviews pointed the same way: 73% said Tier-1 institutions benefit more, and 68% said SAUs are under-represented in usage statistics. Reserved APC quotas, dedicated coordinators and targeted infrastructure grants therefore look necessary.

6.4 APC support and the citation advantage

The APC component nudges India from a consumer model of scholarly communication towards a producer model. Of the 847 approvals in 2025, 31% were agricultural, which speaks to the cost barrier cited by 68% of SAU researchers [12]. International gold OA articles received 42% more citations and 2.2 times higher altmetric scores than subscription articles. We treat this difference with caution. It is observational and may reflect stronger work being steered into gold OA [33], and our comparison did not control for field, year or journal quality. Domestic gold OA articles averaged fewer citations than subscription articles (8.7 against 13.0). This suggests that OA status alone does not secure visibility and that the standing of the venue counts. Multi-level approval delays, limited coverage of society journals and the lack of institutional coordinators remain obstacles to APC use.

6.5 Agriculture-specific considerations

ONOS leaves out CAB Abstracts, AGRIS, AGORA and FAOSTAT, which makes systematic reviews harder. Access is limited to affiliated institutions, so extension workers and farmers are excluded; green OA mandates, diamond OA funding and a public-access tier could help here. Because the scheme covers articles only, it also does little for FAIR data practices [34]. Tying APCs to data deposition and funding data papers would address this, and open data have been linked to citation benefits [35].

6.6 International comparison

ONOS resembles Germany's DEAL and the Dutch VSNU in using a single national negotiator and pairing read access with publishing support [15, 17]. It differs in serving more than 6,300 institutions of very uneven capacity, managing APCs centrally and operating in an LMIC setting. For other LMICs, the lessons are that consolidation brings scale, that central APC funding is feasible, and that equity depends on targeting and training. Steady government funding, political backing and India's market leverage may not be easy to replicate elsewhere.

6.7 Theoretical implications

Our findings suggest three refinements to the framework in Section 2.4:

- A fifth dimension, infrastructure sustainability, covering funding, publisher relations, and technical and institutional capacity;
- A participation continuum that runs from passive reading through green, hybrid, gold and diamond OA to data sharing, of which ONOS supports only hybrid and gold; and
- Moderators such as institution type, career stage, disciplinary norms and geography, which shape whether access becomes participation.

6.8 Policy recommendations

Short-term actions (2026–2027).

1. **Disaggregate usage analytics.** INFLIBNET should add subject-level filters (AGROVOC tags or Scopus subject areas) to the ONOS dashboard and train librarians to use them. That would make it possible to track agricultural usage and to spot underserved subdomains, such as agricultural economics and post-harvest technology.
2. **Run targeted APC awareness campaigns.** ICAR and INFLIBNET should prepare multilingual training materials, hold 50+ workshops across SAUs and ICAR institutes, and set up a helpdesk staffed with agricultural specialists. We suggest aiming to lift the application rate among aware researchers from 22% to 60% and to cut processing time from 30 days to 7.
3. **Link APCs to data repositories.** Agricultural data deposition guidelines should be developed, repository links built into the APC portal, and APC priority given to publications with open data or code. We suggest a target of 50% of ONOS-funded agricultural publications with open data or code by end-2027.
4. **Pilot APC plus diamond OA bundles.** Ten high-impact agricultural diamond OA journals should be identified and supported through bulk subscriptions or direct funding, and the effect on practitioner access and citations evaluated in early 2027.

Medium-term actions (2027–2030).

1. **Add agricultural databases.** A feasibility and cost-benefit study (2027) should come first, followed by negotiations with CABI, FAO and other providers (2028), a pilot for ICAR institutes and SAUs (2029) and a full rollout of CAB Abstracts, AGRIS, AGORA and FAOSTAT by 2030.
2. **Build a national agricultural data repository network.** FAIR-compliant repositories linked to publications through DOIs and ORCIDs should move from specification (2027) to pilots at 5 ICAR institutes and 5 SAUs (2028), a national rollout with mandatory deposition (2029) and integration with Dryad, Zenodo and Figshare (2030). We suggest a target of 80% of ICAR and SAU publications linked to open datasets by 2030.
3. **Incentivise data papers and registered reports.** Evaluation criteria should be developed (2027), APC eligibility extended (2028) and promotion criteria adjusted (2029). The aim is for 20% of ONOS-funded agricultural publications to be data or software papers or registered reports by 2030.
4. **Monitor longitudinally.** This study can serve as the baseline for annual tracking of OA trends, citation impact and collaboration. Altmetric and policy citations should be added (2028–2030), with a five-year impact assessment in 2030.

6.9 Limitations and future research

The main limitations of the study are the approximate subject-level estimates (18–22%), the single year of observation, a before-and-after design without a control group, self-selection among interviewees, APC data available only in aggregate, citation lag for 2025 publications, and a citation comparison that is observational and lacks field normalisation and significance testing. Future work should look at how ONOS benefits are distributed across institution types, regions and demographic groups, and at whether more OA publishing goes with greater citation impact, collaboration and societal impact. It should also estimate the cost-benefit ratio of ONOS against the earlier consortia, examine how publishers respond to national consortia, and test which funding models can sustain ONOS beyond its first three-year allocation, including extension to private institutions. Machine-learning classification for subject-level usage analytics, citation network analysis of knowledge flows and participatory evaluation, along with comparative studies with DEAL, VSNU, CAPES and SANLiC, would add to the evidence.

7. CONCLUSIONS

ONOS is a significant step in India's scholarly communication infrastructure, and it matters for agricultural sciences in particular. The first year brought real gains, and some gaps stayed open.

Key findings. Agricultural institutions saw journal access rise by 341% and download intensity by 215%. ONOS approved 847 APC applications in 2025, 31% of them in agricultural sciences, which speaks directly to cost barriers. International gold OA articles had 42% higher citations and 2.2 times higher altmetric scores, though this advantage is observational. Seven agricultural or veterinary universities appeared among the top 20 institutions by downloads.

Persistent challenges. Awareness of APC support is still low: 27% of researchers did not know about it, and 51% of the rest had not applied. Only four SAUs appeared among the top 100 institutions by downloads. Key agricultural databases (CAB Abstracts, AGRIS, FAOSTAT) are not included, and multi-level approvals and the lack of institutional coordinators get in the way of APC use.

Implications. We recommend subject-level usage analytics, targeted awareness campaigns, links between APCs and data repository workflows, extension of ONOS to agricultural databases and e-books, and long-term monitoring. ONOS gives India's agricultural researchers a basis for moving from consumers of global knowledge to active contributors. That shift will need sustained investment, targeted capacity building and continuous evaluation. With India facing food security, climate adaptation and sustainable intensification challenges, open access to global knowledge, and the ability to share findings openly, is both an academic and a national priority.

This study offers a baseline for judging the long-term impact of ONOS and a framework that other LMICs can adapt. Later work should follow outcomes across 2025–2030, assess sustainability beyond the initial funding window, and look at links with the Anusandhan National Research Foundation, Digital India and open science initiatives.

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