

Enhancing the Impact of Indonesian Scientific Publications: Policy Strategies for Improving the FWCI

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Abstract

The rapid growth of scientific publications has shifted research evaluation from publication quantity toward scientific quality and citation impact. One of the most widely accepted indicators of research influence is the Field-Weighted Citation Impact (FWCI), which measures citation performance relative to the global average within the same discipline, publication type, and year. Although Indonesia has experienced remarkable growth in publication output and international visibility, its FWCI remains below the global average, indicating that increased visibility has not been translated into proportional scientific influence. This study aims to formulate evidence-based policy strategies to improve the FWCI of Indonesian scientific publications through a comparative analysis of publication performance and policy interventions. An explanatory comparative research design with an ex post facto approach was employed using secondary data obtained from SciVal, national policy documents, and relevant international literature. Data were analyzed descriptively and comparatively using the Ultrasound (Urgency–Seriousness–Growth) method, the Five Whys analysis, Dunn’s policy evaluation framework, and an Impact–Feasibility Priority Matrix. The findings reveal that Indonesia occupies a unique position in ASEAN, characterized by high publication visibility but relatively low citation impact. The analysis identifies quantity-oriented publication policies, limited international collaboration, insufficient researcher competencies, and inadequate support for high-impact publications as the principal barriers to improving FWCI. Among the evaluated policy alternatives, strengthening researcher competencies achieved the highest priority because of its high feasibility, broad institutional reach, and long-term effectiveness. The study concludes that integrating competency development, impact-based incentives, strategic international collaboration, and support for publication in reputable journals is essential to enhance Indonesia’s global research competitiveness and sustainably improve its FWCI.

INTRODUCTION

In the midst of the increasing number of global scientific publications, research institutions are required not only to be quantitatively productive, but also to excel in their scientific quality and impact. Increasing global scientific publications is an annual target for research institutions, including BRIN and universities. One of the key indicators to measure this quality is Field Weighted Citation Impact (FWCI). FWCI is the ratio between the actual number of citations of a publication and the number of expected citations, based on the global average in the field of science, type of document, and year (Elsevier, 2022). The FWCI value = 1 means that it corresponds to the world average, above 1 means higher than the average, and below 1 means lower. In its efforts to improve, Indonesia faces strategic challenges in increasing FWCI as an indicator of scientific impact. Although Indonesia's Field-Weighted

View Impact (FWVI) is relatively high, the conversion rate of visibility into international citations is still low, indicating a gap in the quality and relevance of the research. Data from SciVal shows that Indonesia's FWCI in 2024 is still below the FWCI of ASEAN countries. This indicates the need for policy interventions that focus on improving the quality, relevance, and international visibility of science.

Indonesian scientific publications have indeed increased rapidly in terms of quantity, but the quality of scientific impact is still lagging behind. SciVal data for 2024 shows that Indonesia's Field-Weighted Views Impact (FWVI) reaches 1.89 – relatively high – but the Field-Weighted Citation Impact (FWCI) is only 0.80, the second lowest in the ASEAN region. This means that Indonesian scientific works are widely read, but not sufficiently cited in the global literature. This condition confirms the fundamental gap between scientific visibility and influence, which in turn weakens the competitiveness and reputation of Indonesian research at the international level.

The gap between FWVI and FWCI has serious implications for the achievement of the national development agenda. The 2020–2024 RPJMN explicitly targets an increase in international publications of up to 36,500 articles with a total of 150,000 citations by 2024. The target does not only measure numerical productivity, but also emphasizes the importance of global recognition through citation as an indicator of research quality and relevance. With FWCI still lagging behind, the achievement of the 150,000 citation target has the potential to not be achieved optimally, thereby reducing Indonesia's legitimacy in the global science arena and weakening the role of science and technology as a pillar of sustainable development.

The rapid expansion of global scientific production has intensified competition among countries and research institutions to demonstrate not only publication productivity but also meaningful scholarly influence. In this environment, the number of publications alone is insufficient to represent research excellence because scientific contributions are increasingly assessed through their visibility, citation performance, international reach, and contribution to subsequent knowledge development. Field-Weighted Citation Impact (FWCI) has therefore become an important indicator because it normalizes citation impact according to the field of study, publication year, and document type, allowing research performance across different disciplines and institutions to be compared more fairly. An FWCI value of 1.00 represents the global average, whereas a value above or below 1.00 indicates citation performance above or below the expected international level, respectively. Elsevier also recognizes FWCI as an article-level metric used within Scopus and SciVal to assess the influence of scholarly outputs in their disciplinary context.

The growing use of normalized citation indicators reflects a broader international shift from output-based assessment toward impact-oriented research governance. Governments, universities, and funding agencies increasingly use bibliometric information to benchmark institutional performance, identify strategic research strengths, evaluate collaboration networks, and formulate research-investment priorities. SciVal supports these functions by providing field-weighted and normalized metrics that enable institutions to compare their research performance with national, regional, and international peers. However, bibliometric indicators must be interpreted carefully because citation performance can also be influenced by publication age, disciplinary citation practices, collaboration patterns, journal visibility, open-access status, and the relevance of research topics to the international scientific community.

Consequently, policies intended to improve citation impact should address the research ecosystem comprehensively rather than merely requiring researchers to produce more articles.

Within this global context, Indonesia has achieved substantial growth in scientific publication output but continues to face a significant gap between publication visibility and citation influence. SciVal data presented in the manuscript indicate that Indonesia recorded an FWVI of 1.89 in 2024, suggesting that Indonesian publications were viewed considerably more often than the expected global average. Nevertheless, the country's FWCI was only 0.80, placing Indonesia below the global citation average and in the second-lowest position among the ASEAN countries examined. Indonesia was also identified as the only country located in the quadrant characterized by high visibility but low citation impact. In contrast, Brunei Darussalam and Cambodia recorded FWCI values of 2.55 and 2.76, respectively, while Malaysia, the Philippines, Singapore, Thailand, Vietnam, Myanmar, and Laos all achieved FWCI values above 1.00. These figures reveal that Indonesian research attracts international attention but has not yet been consistently incorporated into subsequent global scholarship.

This condition constitutes a specific policy problem because the high number of views received by Indonesian publications has not been effectively converted into citations. The disparity suggests that accessibility and initial topical attractiveness do not automatically produce sustained scientific influence. Several structural factors may contribute to this problem, including limited methodological originality, insufficient alignment between local research topics and global scientific debates, weak international co-authorship networks, inappropriate journal targeting, uneven scientific-writing competence, and limited financial support for publication in reputable open-access journals. The manuscript further indicates that Indonesia produced approximately 213,213 scholarly outputs, the largest volume among the ASEAN countries analyzed, yet its normalized citation impact remained below the world average. This contrast implies that national publication growth has predominantly strengthened numerical productivity rather than the international use and intellectual influence of Indonesian research.

Previous Scopus-indexed research has provided important evidence regarding the determinants of scientific citation impact. Glänzel and Schubert found that international co-authorship can increase scientific influence by expanding research networks and strengthening the international dissemination of publications. Khor and Yu similarly demonstrated that international collaboration positively affected the citation impact of publications produced by relatively young universities. Leydesdorff, Bornmann, and Wagner further showed that international collaboration and research funding contribute to citation performance, although their influence may differ across institutional and disciplinary contexts. Bornmann also explained that collaborative publications may receive higher normalized citation scores because collaboration can improve research quality, increase intellectual diversity, and broaden the audience reached by an article. These studies consistently indicate that international collaboration is not merely an administrative partnership but a strategic mechanism for connecting researchers to wider knowledge networks and citation communities.

Other studies have emphasized the influence of access models, publication channels, research framing, and institutional incentives. Wang, Liu, Mao, and Fang found that open-access articles generally obtained advantages in citations, usage, and social-media attention because fewer access barriers increased their dissemination. Pinfield, Salter, and Bath nevertheless cautioned that open-access implementation can generate substantial publication

costs, particularly through article-processing charges in hybrid and commercial journals. Holl argued that researchers from developing countries must frame locally grounded findings in ways that are understandable and relevant to international audiences. Chavarro, Tang, and Rafols showed that publications outside mainstream journals may support local knowledge development and knowledge bridging, but they often have limited visibility in dominant international indexing systems. Meanwhile, AlShareef and colleagues reported that financial incentives could increase research production, although incentive design must prioritize quality to avoid encouraging publication quantity without corresponding scientific value.

Despite these valuable findings, the existing literature leaves several important research gaps. First, most previous studies have examined individual determinants of citation impact, such as international co-authorship, open access, journal reputation, funding, or researcher competence, rather than integrating them into a comprehensive national publication-policy framework. Second, limited research has explicitly examined the paradox between FWVI and FWCI, particularly in a country where publications achieve high readership but remain below the global citation average. Third, comparative studies rarely combine Indonesian and ASEAN citation-performance data with structured policy-prioritization approaches. Fourth, previous studies generally identify factors associated with citation impact but provide limited guidance regarding which policy alternatives should be prioritized according to effectiveness, efficiency, adequacy, equity, responsiveness, and administrative feasibility. Therefore, a policy-oriented analysis is needed to translate bibliometric evidence into realistic and implementable interventions.

Addressing this gap is urgent because low citation impact may weaken the international reputation of Indonesian research institutions, reduce the contribution of national science to global knowledge, and limit Indonesia's competitiveness in international university and research-performance assessments. A persistent FWCI below 1.00 also indicates that public investment in research and publication has not produced an impact proportional to the volume of scholarly output. When incentives remain focused on the number of indexed articles, researchers may prioritize rapid publication rather than methodological rigor, substantive novelty, data quality, international relevance, and long-term knowledge contribution. Without policy reform, Indonesia may remain trapped in a pattern of high publication visibility but limited intellectual influence. Consequently, research-performance evaluation needs to move beyond publication counts and incorporate normalized impact, responsible international collaboration, research relevance, and sustainable improvements in researcher competence.

The novelty of this research lies in its integration of bibliometric comparison and public-policy evaluation to formulate strategies for improving Indonesia's FWCI. Rather than examining citations solely as an academic-performance outcome, the research treats the FWCI–FWVI disparity as a national policy problem that requires systematic diagnosis and prioritization. It compares Indonesia's performance with that of ASEAN countries, identifies the most critical problem through the Urgency–Seriousness–Growth approach, explores its underlying causes through the Five Whys analysis, and evaluates alternative interventions using Dunn's policy criteria and an impact–feasibility matrix. Through this integrated framework, the study assesses four complementary strategies: focused global research collaboration, impact-based publication incentives, competitive funding for Q1 and open-access publications, and

competency-strengthening programs for researchers. This approach provides a more operational contribution than studies that merely describe citation determinants.

Accordingly, this research aims to examine the disparity between the visibility and citation impact of Indonesian scientific publications, identify the policy and institutional factors contributing to Indonesia's low FWCI, compare Indonesia's performance with selected ASEAN countries, and determine the most appropriate policy strategies for strengthening international research influence. Its theoretical contribution is to extend scientometric and research-policy literature by linking normalized citation indicators with policy-prioritization frameworks. Its practical contribution is to provide BRIN, the Ministry responsible for higher education and science, Bappenas, universities, and research institutions with evidence-based recommendations for redesigning publication incentives and capacity-building programs. The expected benefits include stronger research quality, more productive international collaboration, improved publication targeting, broader access to reputable publication channels, higher citation impact, and a more sustainable transition from quantity-oriented publication policies toward an internationally competitive and impact-oriented research ecosystem.

METHOD

This study uses an explanatory comparative study approach, which aims to compare the policies and strategies of Indonesian scientific publications in improving Field-Weighted Citation Impact (FWCI) with ASEAN countries that have higher FWCI performance. This research is *ex post facto* by utilizing secondary data, so that the analysis is focused on the publication policy pattern without manipulation of variables (Sugiyono, 2012). The main focus of the research is to analyze policy patterns, strategy effectiveness, and the context in which scientific publication quality improvement programs contribute to the impact of citations.

The data analysis process was carried out in a descriptive-comparative manner, with systematic steps: identification of Indonesian national and institutional FWCI, assessment of comparative country strategies, analysis of differences in policy structures, and formulation of strategic recommendations. The study adopted a comparative logic based on performance indicators, including the national average of FWCI per year, the number of countries with FWCI >1, the high ratio of FWCI articles to total publications, the proportion of international collaborations, and engagement in open access publications (Wang et al., 2015). These indicators are used as an evaluative tool in measuring the impact of the implementation of publication policy strategies. The stages in the preparation of this paper are:

1. Determine key issues with ultrasound methods
2. Conducting a 5 Whys Analysis to Determine the Root of the Problem
3. Processing Scival Data: FWCI and FWVI Indonesia in 2021-2024 and FWCI and FWVI 10 Asean Countries in 2024 (Indonesia, Thailand, Malaysia, Philippines, Laos, Myanmar, Singapore, Vietnam, Cambodia and Brunei Darussalam)
4. Creating an Intervention Priority Matrix using scatter plots and analyzing the quadrant position of FWCI Indonesia
5. Developing Policy Alternatives to Increase Indonesia's FWCI
6. Conduct an evaluation using the criteria framework of Dunn (1999) which includes: a) Effectiveness; b) Efficiency; c) Adequacy; d) Equity; e) Responsiveness; f) Administrative and Political Eligibility.; with a rating scale of 1-5.

7. Compiling a Policy Priority Matrix (Priority Matrix) for the improvement of FWCI Indonesia based on Impact vs Feasibility.
8. Choosing the best policy is a combination of the Dunn and Priority Matrix frameworks.

RESULTS AND DISCUSSIONS

According to Elsevier's Pure Help Center, FWCI is the ratio between the number of citations received by a publication and the number of citations expected based on the global average for the same field, document type, and year of publication. An FWCI value of 1 indicates that the publication has a citation impact that matches the world average. A value above 1 indicates a higher impact, while a value below 1 indicates a lower impact. FWCI is used to assess the impact of author citations compared to the average in their field. The FWCI allows for fair comparisons between authors from different disciplines by normalizing differences in citation practice between fields. It helps in the evaluation of individual or group research performance (Deakin University Library Guides, 2025).

These FWCI metrics are used to assess research performance. FWCI is calculated by comparing the actual number of citations received by an output with the expected number of citations for outputs with similar characteristics. This allows for a more accurate assessment of research impact by taking into account differences in the field, type of publication, and year of publication (Monash University Library Guides, 2025). OpenAlex (2025) explains that FWCI is a metric that considers differences in the type of publication, field (or subfield), and year of publication to understand the citation impact of a publication. FWCI is calculated as the ratio between the number of citations received and the number of citations expected in the year of publication and the following three years. OpenAlex emphasizes that differences in the underlying data can affect FWCI values, and they use a subfield classification approach based on the text of the work, not just the journal's main field. Here is a comparison of FWCI between Indonesia and several comparative countries from 2024.

Table 1. FWCI and FWVI ASEAN Countries

<i>Entity</i>	<i>Field-Weighted Citation Impact</i>	<i>Field-Weighted Views Impact</i>
Brunei Darussalam	2,55	2,61
Cambodia	2,76	2,7
Indonesia	0,8	1,89
Malaysia	1,2	1,93
Philippines	1,18	1,84
Singapore	1,95	1,39
Thailand	1,09	2,21
Vietnam	1,15	1,23
Myanmar	1,03	1,64
Laos	1,33	1,72

Source. Scival Scopus (processed)

FWCI and FWVI data in the ASEAN region show challenges as well as opportunities for Indonesia in strengthening the impact of research. Indonesia recorded an FWVI of 1.89, which indicates that scientific publications from Indonesia are quite often seen at the global level. However, the FWCI of only 0.80 shows that Indonesia's publication citations are still below the

world average, and are the second lowest in ASEAN. This phenomenon shows a disparity between visibility and scientific influence. Indonesian publications are quite in demand topically, but they lack a significant contribution to the global scientific literature. Instead, countries such as Cambodia and Brunei Darussalam are able to balance high visibility with strong citations, allegedly through intensive international collaboration strategies and publications in high-impact factor journals.

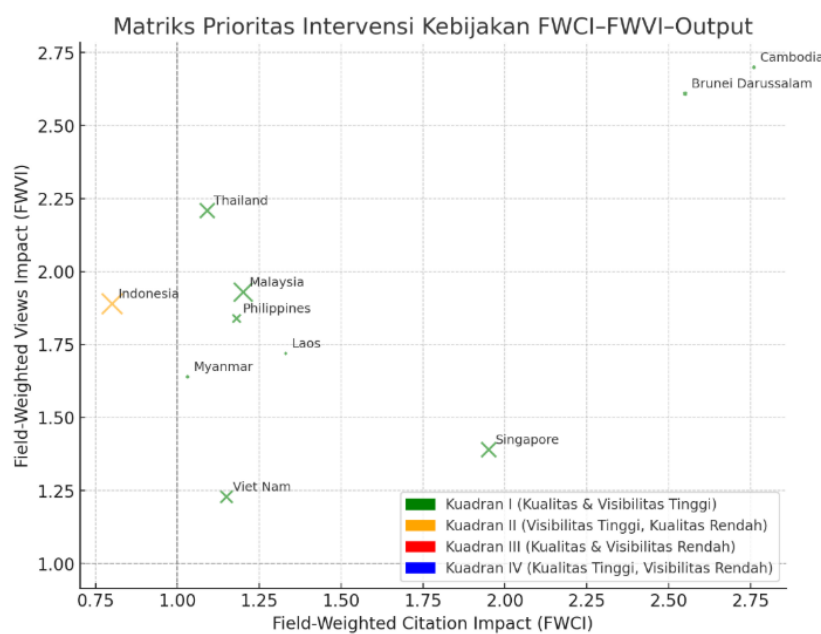


Figure 1. ASEAN countries' priority matrix

Based on the scatter plot analysis of *Field-Weighted Citation Impact* (FWCI) and *Field-Weighted Views Impact* (FWVI), there are striking differences between ASEAN countries in terms of the quality and visibility of scientific publications, which are also influenced by the amount of *scholarly output*. The majority of countries are in Quadrant I ($FWCI \geq 1$, $FWVI \geq 1$) which represent a combination of high research quality and visibility. Countries such as Brunei Darussalam, Cambodia, Malaysia, the Philippines, Singapore, Thailand, Viet Nam, Myanmar, and Laos managed to maintain performance above the world average. Nonetheless, there is great variation in the volume of publications. Malaysia, Singapore, and Thailand occupy positions with very high output, so it is necessary to focus on maintaining quality in the midst of massive quantities. On the other hand, countries such as Brunei, Cambodia, and Laos, despite having a relatively small number of publications, are able to maintain their quality and visibility, so the main challenge is to increase the volume without lowering quality standards.

Meanwhile, Quadrant II ($FWCI < 1$, $FWVI \geq 1$) is only occupied by Indonesia. This position shows that although Indonesian publications are widely read (FWVI is high) and have the largest number of outputs in the region (213,213 publications), the citation rate per publication is still below the world average (FWCI 0.8). This indicates a gap between the visibility and the scientific influence it produces. The policy interventions needed are improving the quality of methodology, adjusting research topics to be more relevant to global trends, and encouraging publication in high-reputable journals (Q1–Q2) through productive international research collaborations.

There are no countries in Quadrant III ($FWCI < 1$, $FWVI < 1$) or Quadrant IV ($FWCI \geq 1$, $FWVI < 1$). This shows that in general, ASEAN countries are able to maintain the visibility of their publications above the world average. Overall, this map shows that policy priorities in the region vary. Countries with large outputs in Quadrant I must maintain quality while managing publication growth. Countries with small outputs in Quadrant I need to increase publications while maintaining quality. Meanwhile, Indonesia, as the only country in Quadrant II, needs a special strategy to turn high visibility into citation impact equivalent to global standards.

SciVal data for the 2021–2024 period shows that Indonesia is the only country in the ASEAN region that is in the position of Quadrant II, namely having a high Field-Weighted Views Impact (FWVI) but a low Field-Weighted Citation Impact (FWCI). This condition illustrates the paradox of Indonesian scientific publications: the work of national researchers is quite often seen and accessed, but not much has been used as a reference in the global literature. In other words, the visibility of publications is strong, but its relevance to the international research agenda is still low.

Various studies have highlighted the factors that influence this gap. Glänzel and Schubert (2001) and Khor and Yu (2016) affirm that international collaboration has been proven to be one of the main determinants of citation increases. Publications involving cross-border research networks have a greater chance of being cited because they receive recognition from the global scientific community. On the other hand, open access has also been proven to be able to expand the reach of scientific works. Wang et al. (2015) showed that articles published through open access channels have higher rates of citations, downloads, and public attention than articles published in a limited way. In addition, the competence of researchers in compiling scientific manuscripts that are relevant to a global audience is also an important factor. Holl (2017) emphasized that researchers in developing countries often face challenges in framing local research to have international appeal, so their research results receive less attention and citation.

Policies That Have Been and Are Being Implemented

The existing policies that support the issue of this article are:

1. RPJMN 2020–2024 (target to increase international publications).

In the 2020–2024 National Medium-Term Development Plan (RPJMN), the government places improving the quality of human resources and strengthening research and innovation as one of the priority development agendas. In it, there is an explicit target to increase the number of international scientific publications and citations as an indicator of the success of national science and technology. Baseline data in 2017 recorded 16,147 international publications with 72,146 citations, while the target for 2024 is set to reach 36,500 international publications with 150,000 citations. This figure reflects a national ambition to not only pursue productivity in the number of publications, but also improve its quality and impact on the global scientific community. The quantitative target in this RPJMN is also the basis for ministries/institutions, including BRIN and Universities, to design policies that encourage improvement in the quality of publications. With a clear citation target, the RPJMN emphasizes that the success of Indonesian research development is not enough to measure the number of articles published, but also from the extent to which the article is recognized and used as a reference in the global literature.

2. BRIN Strategic Plan 2022-2024 (focus on improving research collaboration & publication quality).

In the BRIN Strategic Plan (Renstra) 2022–2024 document, the government affirms its commitment to increasing collaboration in the development and utilization of science products, while strengthening the contribution of science and technology to national development. This strategic goal is directly related to efforts to improve the quality of publications and superior research, because research collaboration is believed to be able to expand scientific networks, enrich methodological perspectives, and increase opportunities for international citations. The same thing was also emphasized in the official presentation of BRIN's Strategic Plan, which stated that the main goal of this institution is to improve the quality and quantity of research while facilitating collaboration across actors—both between the government, industry, and society. This approach reflects a shift from a research paradigm that focuses only on numerical productivity to research that is oriented towards global impact and relevance.

3. Higher Education publication incentives.

The scientific publication incentive policy in Indonesia is one of the government's strategic instruments to encourage the improvement of the quality and quantity of national research. The Directorate General of Higher Education, Research, and Technology (Ditjen Dikti) has launched various financial and reputational award schemes for lecturers and researchers who have successfully published their work in internationally reputable journals, such as Scopus, Web of Science, and DOAJ. This program is positioned as a stimulus for researchers to be more actively competitive in producing publications that are not only large in number, but also recognized for their quality by the global scientific community. An article from the Ridwan Institute emphasizes that these incentives play an important role in increasing the motivation of lecturers and researchers to penetrate reputable international journals. The same thing was also emphasized by Green Publisher, which stated that the publication incentive policy can function as a financial incentive as well as academic recognition, so that it can strengthen the reputation of institutions and individual researchers. In line with that, the official website of the Directorate General of Higher Education in 2022 confirmed the launch of an incentive program to increase reputable scientific articles, which is directed to expand the number of national publications on international channels that have a high citation impact.

Although the 2020–2024 RPJMN has set an ambitious target of increasing the number of international publications to 36,500 articles with 150,000 citations, the policy still emphasizes the aspect of quantity rather than quality. Focusing on the number of publications indicator has been shown to drive a massive increase in output, but it does not automatically increase the Field-Weighted Citation Impact (FWCI). With FWCI Indonesia still at 0.80, the national citation target is difficult to achieve because the published articles are not relevant and quality enough to be used as a global reference. Policy *gap analysis* shows that there is a gap between the incentives provided and the expected results. The national publication incentive scheme is still oriented towards the number of indexed articles, thus encouraging researchers to publish as much as possible, without guarantee of methodological quality, topicality, or international relevance. As a result, although Indonesian publications are increasingly visible (*high visibility*), their scientific influence (*low citation impact*) remains low. This shows that quantity-based incentives are not aligned with the strategic need to improve the quality of research and global citations.

If this policy is not adjusted immediately, the risk that arises is a huge waste of resources and publication funds without producing a significant citation impact. Indonesia will continue to be trapped in the paradox of publications: widely read but rarely cited. This condition not only hinders the achievement of the 2020–2024 RPJMN target, but also reduces Indonesia's legitimacy in the global science arena, as well as weakens the role of research as a pillar of sustainable development.

Policy Alternatives and Evaluations

The findings of the above analysis confirm that the orientation of national publication policy that is still quantity-based has created a serious gap between the visibility and impact of citations. To bridge this gap, policy interventions that focus more on research quality, methodological novelty, global relevance, and support for high-reputable publications are needed. Taking into account the challenges and risks of current policy failures, the formulation of alternative policies is a strategic step so that the government has measurable, evidence-based, and realistic options to increase the FWCI of Indonesian scientific publications.

National Program for Focused Global Research Collaboration

Objective: To increase the relevance and citation of Indonesian publications by involving researchers from countries with high FWCI (e.g. Singapore, Brunei, and non-ASEAN developed countries). In line with the findings of Glänzel and Schubert (2001), Khor and Yu (2016), and Tong and Ahlgren (2017) who affirm that international collaboration contributes positively to the increase in citations. Collaboration with countries with high FWCI not only expands the citation network, but also increases the methodological relevance and research topics that have the potential to become global references. Empirical support also comes from Leydesdorff et al. (2017) who emphasize that international collaboration directed at global and local issues can significantly improve FWCI. Thus, the policy of establishing an international research consortium and the co-authorship target of at least 30% of foreign partners is a strategy rooted in scientific evidence.

Impact-Based Incentive Scheme

Objective: Shift the focus from the quantity of publications to the quality of impact (citations and views). This policy gained academic legitimacy from the research of Kochetkov (2018) who assessed FWCI as the most representative indicator to assess research performance. In line with that, the study of Bornmann & Haunschild (2016) shows that publications in reputable journals consistently generate greater citations, so the quality indicator (FWCI) is more relevant than just the number of publications. Furthermore, evidence from AlShareef et al. (2023) in Saudi Arabia shows that publications quality-based incentives have been proven to be able to improve both the quantity and quality of national research. This confirms that FWCI & FWVI-based incentive schemes are very strategic for Indonesia to shift the paradigm from pseudo-productivity to real scientific impact.

Q1 Publication Competitive Fund & Global Open Access

Objective: To overcome the financial barriers of researchers to enter a reputable and open journal. This third policy has strong support from Pinfield et al. (2016) and Wang et al. (2015) who found that publication through Open Access (OA) channels has a sustained advantage in global citation, use, and distribution. Karen Holl (2017) also emphasized that researchers in developing countries need to direct publications to a global audience, which is easier to achieve through Scopus/WoS indexed OA journals. Therefore, the existence of a Publication Support

Fund to finance the *Article Processing Charges* (APC) of the Q1 OA journal will overcome financial barriers while expanding the impact of global citations.

Researcher Competency Strengthening Program for Reputable Publications

Objective: To improve the ability of Indonesian researchers to write, develop methodologies, and select the right target journals. In line with various literature that highlights the importance of scientific writing skills, methodological selection, and research framing to be internationally relevant. Holl (2017) emphasized the challenge of emerging country researchers in making local research attractive to a global audience. Meanwhile, Chavarro, Tang, & Rafols (2013) and Sweileh (2020) show that interdisciplinary research and local issues associated with global problems can result in higher citations. In fact, Wang et al. (2022) and Omar & Abdullahi (2024) affirm that digital transformation and well-processed local themes are able to significantly increase FWCI. Therefore, training such as the High-Impact Publishing Bootcamp, international mentoring, and publication guidelines based on global citation trends are the key to strengthening the capacity of Indonesian researchers.

Overall, these four policy alternatives complement each other: international collaboration expands citation networks, impact-based incentives change the orientation of publications, OA publication funds open access to reputable channels, and strengthening the competence of researchers ensures the quality of research substance. The combination of these four can be an integrated strategy to close the gap between high visibility (FWVI) and low citation impact (FWCI) in Indonesia. To determine the policy to be taken, an alternative policy evaluation formulation will be carried out using the criteria of Dunn (1999). Dunn (1999) in Setyowati (2025) uses this criterion to choose which policy to use, the criteria include:

- a. Effectiveness: Policy ability to achieve the main goal of increasing Indonesia's FWCI .
- b. Efficiency: A comparison between benefits and implementation costs.
- c. Adity: Policy capabilities reduce the problem significantly.
- d. Equity: Equitable distribution of policy benefits, i.e. eliminating the human factor
- e. Responsiveness: How quickly policies respond to urgent needs.
- f. Administrative and Political Eligibility: The ability of policies to be realistically implemented by the government.

Rating Scale:

5 = Excellent

4 = Good

3 = Enough

2 = Less

1 = Very Less

The assessment is based on literature studies, empirical analysis, and logistical and political considerations. To score each criterion, *expert judgment* and empirical evidence approaches were used. The evaluation using the Dunn Criteria was chosen because public policy assessment does not only rely on quantitative data, but also requires a substantive understanding of *expert judgments* who have direct experience in planning, research management and scientific publications. Scoring on Dunn's checklist is done by accumulating:

- a. The empirical evidence used as the basis for ultrasound is FWCI/FWVI data from SciVal, and Indonesian publication trends.
- b. Academic literature related to the impact of publication policies.

- c. Compliance with national planning documents (RPJMN 2020-2024 and BRIN Strategic Plan 2022-2024).

The final score was obtained from the average results of the experts' assessment. Thus, this method ensures that the evaluation is not purely subjective, but based on a combination of quantitative data, literature review, and realistic policy considerations.

Table 3. Evaluation of Dunn's criteria (1999)

<i>Evaluation Criteria</i>	<i>National Program for Focused Global Research Collaboration</i>	<i>Impact-Based Incentive Scheme</i>	<i>Q1 Publication Competitive Fund & Global Open Access</i>	<i>Researcher Competency Strengthening Program</i>
Effectiveness	5 – International collaborations are proven to increase the citation and global relevance of publications.	4 – Incentives can change publication behavior, but the effect depends on the researcher's awareness.	4 – Opening access to Q1 journals has the potential to increase FWCI, but does not directly affect the quality of research content.	3 – Increased competence has a long-term effect, the short-term effect on FWCI is smaller.
Efficiency	3 – High costs (travel, collaboration, project management), great benefits if on target.	4 – Relatively inexpensive compared to the potential impact, especially if it is results-based.	3 – APC cost is high, requires strict selection to be on target.	5 – Relatively low cost, widespread benefits in many institutions.
Sufficiency	4 – Reducing the citation gap is quite significant, especially in priority research areas.	3 – Encourage behavior change, but need to be supported by other factors.	3 – Helps publication in prestigious journals, but does not guarantee high citations.	4 – Target the root of the problem of writing quality and methodology.
Equity	4 – Opportunity to involve researchers from the region if the program design is inclusive.	3 – Can be biased towards large institutions with a track record of publications.	3 – Established institutions have an easier time utilizing these funds.	5 – Easily reach out to different regions and research groups.
Responsiveness	3 – It takes time to form effective networking and collaboration.	4 – Can be implemented quickly with a direct incentive mechanism.	4 – The benefits are quickly felt after the funds are distributed.	3 – The effect is gradual, not instantaneous.
Administrative & Political Eligibility	3 – Need for cross-border and ministerial coordination, potential diplomatic obstacles.	4 – Administration is relatively simple, politically easy to accept.	4 – The administration of publication funding is relatively easy, politically neutral.	5 – Its easy and politically acceptable administration.

From the results of the evaluation of alternative policies using the Dunn criteria, the average score for each alternative policy is:

Table 4. Recapitulation of the results of the evaluation of the Dunn criteria (1999)

<i>Yes</i>	<i>Policy</i>	<i>Score</i>
Policy 1	National Program for Focused Global Research Collaboration	3,67
Policy 2	Impact-Based Incentive Scheme	3,67
Policy 3	Q1 Publication Competitive Fund & Global Open Access	3,50
Policy 4	Researcher Competency Strengthening Program	4,17

Based on the evaluation of six criteria by Dunn (1999) effectiveness, efficiency, adequacy, equality, responsiveness, and administrative and political feasibility, it can be seen that:

- 1) The Researcher Competency Strengthening Program obtained the highest score (4.17), the main advantages are low cost, wide reach, and ease of implementation. Although the impact on FWCI is more long-term, the program builds the foundation of sustainable research quality. The aspect of equality is also very high because it can reach researchers in regions and groups that have been less facilitated.
- 2) The National Programme for Focused Global Research Collaboration and Impact-Based Incentive Schemes has a balanced score (3.67) but with different characters. Global collaboration excels in terms of effectiveness in improving citations, but faces feasibility challenges because it requires cross-border coordination and high costs.
- 3) Impact-based incentive schemes are superior in efficiency and responsiveness, making them suitable for changes in publication behavior in the short term. The Q1 Publication Competitive Fund & Open Access is slightly below (3.50), the program is quickly benefiting, but the benefits are highly dependent on the quality of the research funded. Without strict selection, the risk of a mismatch between cost and impact is considerable.

Furthermore, a Policy Priority Matrix (Priority Matrix) for improving FWCI Indonesia based on Impact vs Feasibility is prepared:

- 1) The High Impact – High Feasibility Quadrant, namely Policy 4: Researcher Competency Strengthening Program, occupies this position. With high administrative and political feasibility and low costs, the policy can be implemented widely and quickly, while having a long-term positive effect on the quality of publications and citations.
- 2) Strategic Investment Quadrant (High Impact – Low Feasibility). **Policy 1:** Focused Global Research Collaboration Programs fall into this category. Although the impact is large on FWCI, the program requires substantial funding support, international agreements, and complex collaborative management. Suitable to be run as a medium-long term flagship program.
- 3) Quick Wins Quadrant (Medium Impact – High Feasibility). **Policy 2:** The Impact-Based Incentive Scheme is a quick and easy to implement step to motivate researchers to prioritize the quality of publications. The effect can appear in the first 1–2 years if the incentive mechanism is clear and transparent.
- 4) Quadrant of Advanced Consideration (Medium Impact – Medium Feasibility). **Policy 3:** Competitive Funds Q1 & Open Access publications need rigorous planning so that the benefits of not only increasing publications in expensive journals, but also increasing citations. It needs to be integrated with training or mentoring to ensure the quality of the article.

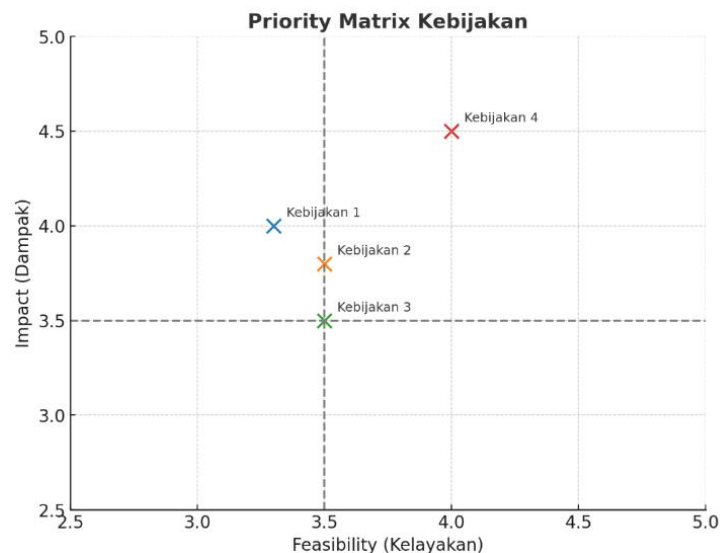


Figure 2. Policy Priorities Matrix

The results of the combination of the Dunn framework and the Priority Matrix provide guidance that FWCI Indonesia's improvement strategy must be multi-layered:

- Long-Term Foundation: Starting from strengthening the competence of researchers, because this forms the basis for sustainable and inclusive research quality.
- Medium-Term Acceleration: Implement global research collaborations to directly connect Indonesian researchers with international citation networks.
- Short-Term Quick Wins: Launch impact-based incentive schemes to change publication behavior and motivate researchers to pursue higher citations.
- Strengthening Supporters: Optimize competitive funding for Q1 publications & open access as an additional facility for research with high citation potential, accompanied by a strict selection mechanism.

Selected Policy Recommendations

The performance of Indonesian scientific publications shows significant progress in terms of visibility, but still faces major challenges in terms of scientific influence. International data confirms that FWVI Indonesia is in a relatively high position, meaning that the work of our researchers is widely read and accessed by the global community. Unfortunately, FWCI is still lagging behind at 0.80 and puts Indonesia in the second lowest position in ASEAN. This is a paradox: our publications are in demand, but rarely used as an academic reference. This situation indicates a fundamental problem in the quality of research, the novelty of the methodology, and the connection with the international scientific network.

The results of the policy evaluation using the framework of Dunn (1999) reinforce these findings. Of the four policy alternatives examined, global research collaboration, impact-based incentive schemes, competitive funding for Q1 publications, and strengthening of researcher competencies emerged as the most strategic choices. The Researcher Competency Strengthening Program for Reputable Publications occupies the *High Impact High Feasibility* position in the *Priority Matrix*. The highest score (4.17) obtained from Dunn's evaluation confirms that this policy excels in terms of efficiency, equality, and administrative and political feasibility. This means that this program not only promises a big impact, but is also realistic to be implemented immediately.

This policy is specifically recommended to the Head of the National Research and Innovation Agency (BRIN) as the main authority in the implementation of national research and innovation; The Minister of Higher Education, Science, and Technology of the Republic of Indonesia (Kemensaintekdikti) who has authority in the management of higher education and academic research; and in terms of national development planning, the Minister of National Development Planning/Head of Bappenas plays a strategic role in ensuring that FWCI indicators are integrated in the RPJMN and evaluating the achievements of science and technology development. The officials who have the authority to determine and make decisions are the Head of BRIN through the Regulation of the Head of BRIN, the Ministry of Science and Higher Education through a Ministerial Regulation, and the Minister of National Development Planning/Head of Bappenas through the Regulation of the Minister of National Development Planning/Bappenas. At the strategic level, this policy can be strengthened with the Presidential Regulation on Strengthening the Reputable Research and Publication Ecosystem to ensure consistency across ministries and institutions. The form of regulation can be in the form of:

1. The Regulation of the Head of BRIN which requires research institutions to report and improve FWCI as part of the agency's KPIs.
2. The Ministry of Science and Higher Education Regulation requires universities to target reputable international journals based on quality, not just the quantity of publications.
3. The Regulation of the Minister of National Development Planning/Bappenas to include FWCI in the RPJMN achievement indicators, for example, makes the increase in FWCI one of the benchmarks for national science and technology development.

The substance of the policy regulates several main things:

- a. Strengthening the capacity of researchers through *scientific writing bootcamps*, international mentoring, and *manuscript review clinics*.
- b. Integration of FWCI indicators as official Key Performance Indicators (KPIs) in BRIN, universities, and in the evaluation of RPJMN.
- c. Quality-based incentives, by adopting the pattern of the Directorate General of Higher Education (2022) incentive scheme which is oriented towards the quality of reputable journals, not just the number of publications.
- d. Prioritization of high-impact research fields (energy, health, food, biotechnology) as stated in the National Research Master Plan (RIRN) 2017–2045.

The implementation of this program can be divided into three time horizons. Short-term (1–2 years): focus on scientific writing training and manuscript mentoring by international mentors. Medium term (3–5 years): strengthening international collaboration networks based on research competencies. Long-term (5–10 years): integration of FWCI indicators as national KPIs in the evaluation of research performance and science and technology development.

Furthermore, this program is inclusive because it reaches researchers from various regions and institutions, including those who have not had access to it. With a more equitable distribution of benefits, the short-term program will improve international publication skills, in the medium term expand collaborative networks, and in the long term drive systemic change by making FWCI an official indicator of national performance. If implemented consistently, the implementation of this policy is believed to be able to close the gap between FWCI Indonesia and ASEAN countries, while converting the already high visibility of publications

into stronger citations. This policy can clearly be a concrete government intervention to solve the problem of low FWCI, because it shifts the paradigm of research incentives from quantity to quality. With BRIN's leadership as a technical implementer, the support of the Ministry of Science and Higher Education in fostering academic human resources for higher education, and the strengthening of regulations from Bappenas in the framework of development planning, this intervention is able to bridge the gap between visibility (FWVI) and citation impact (FWCI).

CONCLUSION

The paradox of Indonesian scientific publications shows that although the FWVI is relatively high (1.89), the FWCI is actually low (0.80), placing Indonesia in the second lowest position in ASEAN. This confirms a fundamental gap: national scientific works are widely read, but have not been able to exert a strong influence in the global literature. The analysis using the ultrasound method shows that publication policies that are still quantity-oriented are the main problem, while the 5 Whys analysis reveals the root problems in the incentive system, research performance evaluation, and weak focus on methodological quality and global relevance.

Four policy alternatives are offered: (1) Focused Global Research Collaboration Program, (2) Impact-Based Incentive Scheme, (3) Q1 & Open Access Publication Competitive Fund, and (4) Research Competency Strengthening Program. Based on Dunn's (1999) evaluation, the Researcher Competency Strengthening Program occupies the highest position with an average score of 4.17 (High Impact–High Feasibility). The main strength of this policy lies in its relatively low cost, wide reach, ease of implementation, and significant long-term impact on improving the quality of publications. However, other policies remain relevant as complements: global collaboration to expand international citation networks, impact-based incentives as quick wins, and competitive funds as instruments to support reputable publications.

Operational recommendations can be divided into three time horizons. In the short term (1–2 years), the focus is directed to scientific writing training, scientific writing bootcamps, and international mentoring to accelerate the improvement of the quality of researchers' manuscripts. In the medium term (3–5 years), global research collaboration programs and impact-based incentive schemes need to be integrated so that Indonesian researchers are more active in reputable publication networks and motivated to pursue citation quality, not just article quantity. In the long term (5–10 years), FWCI indicators should be formally integrated into the national evaluation system, including as a Key Performance Indicator (KPI) in the next RPJMN, so that the success of research development is not only measured by the number of publications but also by the impact of global citations it produces.

The strategic implication of this conclusion is the need for synergy between BRIN, Bappenas and the Ministry of Education and Science. BRIN together with the Ministry of Education and Science must be the driving force in building a quality-based research ecosystem by emphasizing the quality of methodology, international publication skills, and directed funding support. Meanwhile, Bappenas plays a role in ensuring that FWCI indicators are integrated in national development planning and evaluation, so that increasing the impact of scientific publications becomes a joint agenda across ministries and institutions. With a combination of structured, inclusive, and quality-oriented policies, Indonesia is expected to be able to close the gap between FWCI and ASEAN countries and strengthen its position in the global research arena in a sustainable manner.

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