



# Advance your organizational mission with evidence-based insights on international collaborations

Clarivate Academia & Government Consulting



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## Ayman Akil

**Senior Manager, Consulting,  
Academia & Government MENA,  
Clarivate**

Ayman Akil, PhD has extensive experience in academia, governments, corporate R&D industries and cross-collaborations. He has specialized in strategic planning for research enterprises, including the analyses associated with university rankings.

His consulting projects aim at designing and implementing strategies for various research entities to optimize their activities and processes as well as enhance their performance assessment models. Ayman has implemented several national capacity building activities for upskilling researchers, academics and decision makers through targeted workshops and academies. Prior to joining Clarivate, Ayman was a researcher at the Max-Planck Institute for Quantum Optics in Germany.

## Gu Yu

**Senior Consultant, Consulting,  
Academia & Government APAC,  
Clarivate**

Gu Yu, PhD is an experienced clinician, qualitative researcher and project manager. She has worked across a wide variety of sectors including healthcare, government, academia and corporate in Australia,

the US and UK. Prior to joining Clarivate, she delivered a wide range of international, national and regional projects in both the public and private sectors, which included research, policy evaluation, digital implementations, and leadership development programs. Gu Yu focuses on people-centred solutions and offers sustainable results that drive continuous improvement.

# Executive summary

Collaboration among institutions is crucial for continuous development and promoting innovation.

However, with constant change in the research landscape, how institutions collaborate is also evolving. This is further exacerbated with the recent changes in global geopolitical alignments. Universities need to have a nuanced understanding of their research collaborations to build strategic relationships and enhance benefits. High-quality, timely data are critical for universities to effectively monitor their international networks in which their faculty and students are involved in. This will inform decisions about how to form collaborative relationships that promote institutional growth. With the launch of Collaboration-

CNCI (Collab-CNCI)<sup>1</sup>, academics will be able to assess the impact of collaborative research more effectively, benchmark performance across disciplines and identify high-impact partnerships.

This white paper is intended for academic, government and corporate research staff who are part of collaborative relationships that advance their organizational mission and research portfolio. It covers the need to ensure balance among the benefits and risks of collaboration and emphasizes the value of reliable evidence when assessing an organization's collaboration profile.

<sup>1</sup> Making it count: Research credit management in a collaborative world | Clarivate. (n.d.). Academia and Government. <https://clarivate.com/academia-government/lp/making-it-count-research-credit-management-in-a-collaborative-world/>



# Gaining resources and knowledge through teamwork.

As science becomes more complex and requires resources beyond what might be available within the so-called ‘four walls’ of an institution, innovative collaboration models become increasingly necessary.

Benefits for institutions and researchers that look outside of their own countries or regions for research partners include:

- international prestige,
- faster innovation,
- access to multiple and different perspectives and specialists,

- advantages for increased citation impact,
- access to specialized equipment,
- larger research populations, and
- additional funding.

For institutions, external partnership can complement internal resources along many dimensions to achieve academic institutional missions collectively (Figure 1).

For universities, colleges and research institutions, collaborations can facilitate real-world changes such as influencing public policies

and developing new products, therapies, and treatments. International research collaboration has been critical to many of the most important scientific findings to date and plays an essential role in driving research innovation. For example, the collaborative effort between Emmanuelle Charpentier and Jennifer Doudna that led to the development of the CRISPR-CAS9 gene editing system not only earned them the Nobel Prize in Chemistry in 2020 but also made life changing differences to people suffering from genetic diseases.

Figure 1: Varied missions of academic institutions.

	Conducted by the academic sector		Impact on industry, government, etc.
Education and training	Students faculty	Skills and knowledge	Trained workforce, professional development, future academics
Services (consultancy)	Faculty	Expertise	Policy development, process improvement, public engagement
Basic and applied research	Faculty researchers	Acquired knowledge	Journal articles, books, patents, legislation, etc.
Tech transfer and commercialization	Staff	Spin-offs and products	Licences, products and collaborations

Another example is the rapid global response from the scientific community to the COVID-19 pandemic. Clarivate's data showed that research institution-industry partnerships spiked in 2020. Driven by the extraordinary global research effort, the pharmaceutical industry leveraged basic research breakthroughs to find vaccines and treatments for COVID-19 and produced timely treatment globally. This demonstrated how society's biggest challenges often require solutions that span nations, disciplines and industry sectors.

Beyond the pandemic, academic and government institutions are also increasingly focused on the large, complex problems faced by society. The often referred to, "global challenges" require researchers to collaborate across disciplinary boundaries. The recent emphasis of the U.S. National Science Foundation on bolstering 'convergence research' is an example of this.<sup>2</sup> Convergence research is research focused on a complex problem that requires highly collaborative problem framing and solution development; collaboration that integrates knowledge, tools and ways of working across disciplines.

A fundamental feature of convergence research, collaboration across disciplines and indeed borders is prioritized in these initiatives. For many developing countries, collaboration is a standard and effective method to access global research networks. Partners in other regions may have greater access to resources or equipment than local availability provides. Concurrently, the sharing of resources makes efficient use of scarce financial resources across partnering institutions.

<sup>2</sup> Gajary, L. C., Misra, S., Desai, A., Evasius, D. M., Frechtling, J., Pendlebury, D. A., Schnell, J. D., Silverstein, G., & Wells, J. (2023). Convergence Research as a 'System-of-Systems': a framework and research agenda. *Minerva*, 62(2), 253–286. <https://doi.org/10.1007/s11024-023-09503-1>



**"Driven by the extraordinary global research effort, the pharmaceutical industry leveraged basic research breakthroughs to find vaccines and treatments for COVID-19 and produced timely treatment globally."**

Recent decades have seen rapid expansion in the volume of international research collaboration. A study published in *Scientometrics* used Web of Science data to examine more than 10 million articles published by researchers from 200 countries. After analyzing the rate of collaboration at selected intervals between 2000 and 2015, the study's authors reported 306 percent growth in international co-authorship during the period.<sup>3</sup>

An analysis of current 2025 data in InCites Benchmarking & Analytics shows that nearly 25 percent of papers published include international collaboration, compared to 8 percent in the 1990s. Bibliometric analysis of collaboration tends to highlight the benefits of international co-authorship, such as increased rates of publication and citation, and greater visibility for a nation's research enterprise. International collaboration papers

tend to receive 70 percent more citations on average than domestic research. However, collaboration comes with its own risks and potential costs, which often receive less attention. The possible drawbacks of collaboration underscore a need for thorough and reliable data, with which administrators and policy makers can make informed decisions in pursuing international partnerships.

# 306%

**growth in international  
research collaboration  
between 2000 and 2015.**



<sup>3</sup>. Ribeiro, L. C., Rapini, M. S., Silva, L. A., & Albuquerque, E. M. (2017). Growth patterns of the network of international collaboration in science. *Scientometrics*, 114(1), 159–179. <https://doi.org/10.1007/s11192-017-2573-x>

# Three considerations when choosing partners.

With the substantial rise in the volume of international research collaboration, it has become increasingly important to engage in collaboration that fosters growth.

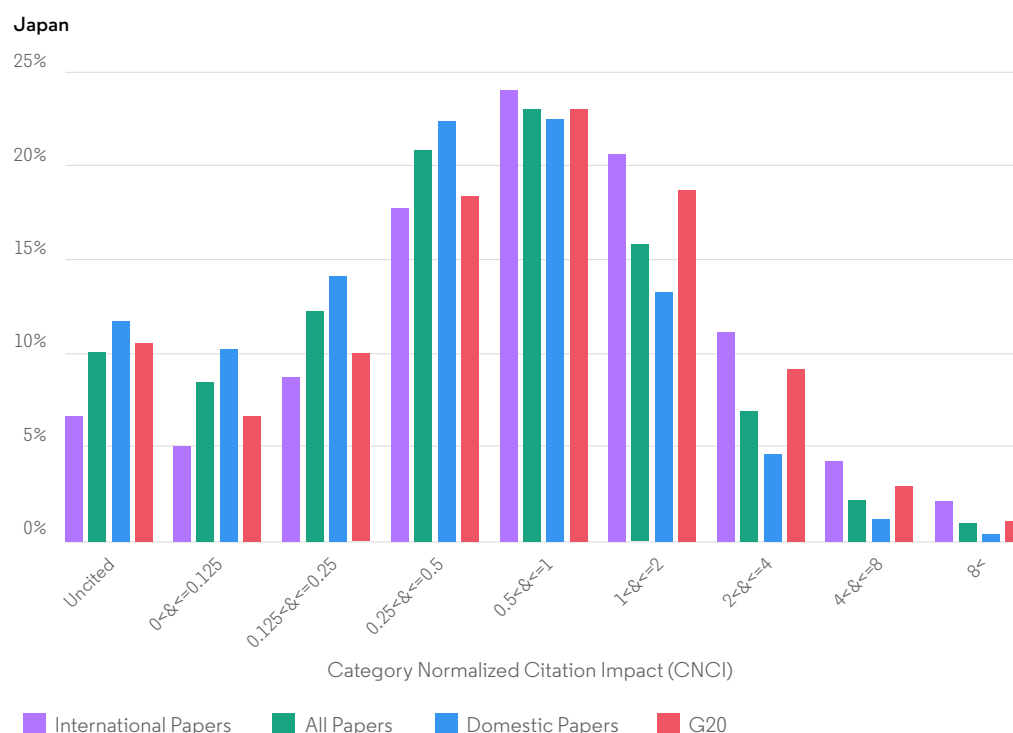
## 1. International collaboration at the expense of domestic research growth

The bibliographic data in the **Annual G20 Scorecard from the Institute for Scientific Information (ISI™)**,<sup>4</sup> which profiles the research performance of the world's G20 economies, show a clear rise in international collaboration. However, for many countries, domestic-only research output is decreasing, as international collaborations take up more resources.

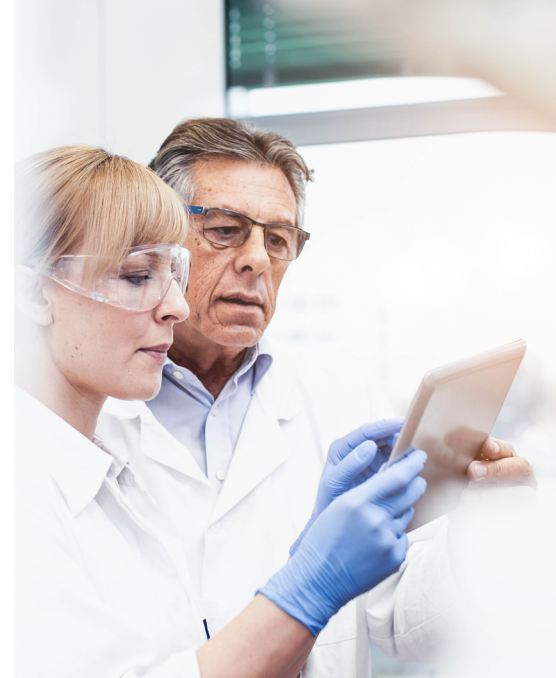
For example, over the 2013-2022 period, research published by Japanese organizations with international collaborators showed a higher normalized citation impact compared to domestic-only research (Figure 2, bottom left). While this increased citation impact from international collaborations, indicating important research outcomes,

it comes at the expense of decreased domestic research base. This is further evident by the higher G20 overall normalized citation impact compared to that of Japan domestic research (Figure 2, bottom right). This suggests that collaborating with G20 countries have likely driven Japan in achieving an elevated impact.

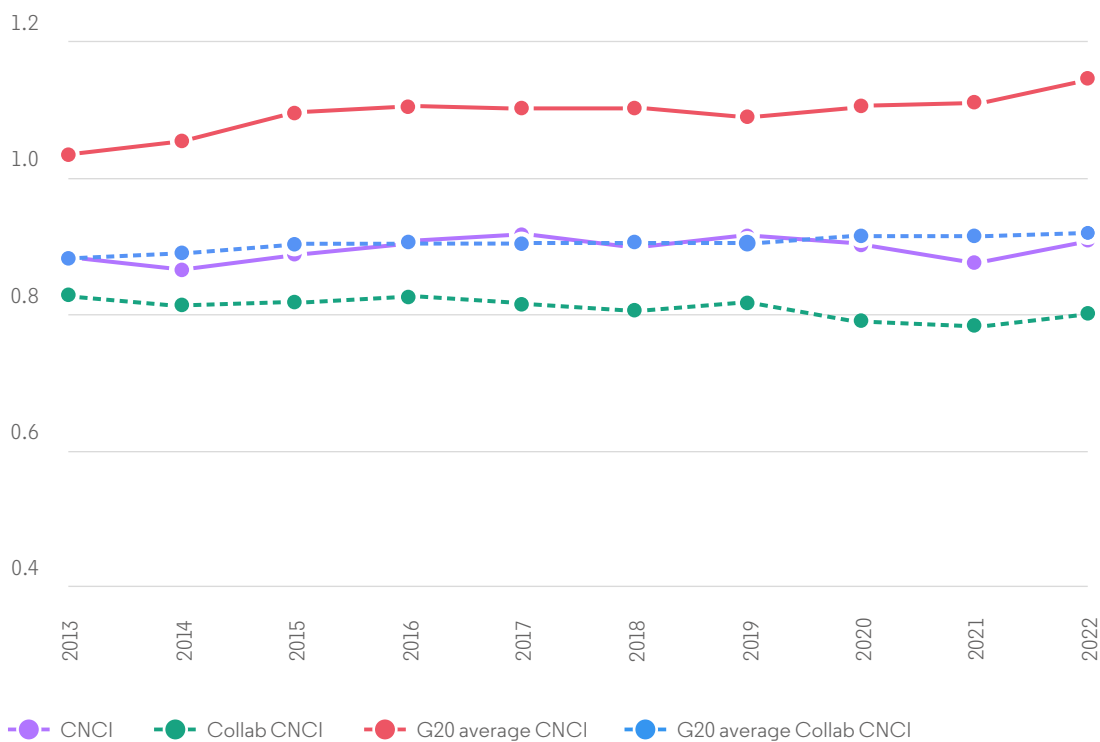
**Figure 2: The citation impact of the papers published by each country/region.** This is presented in both an Impact Profile and the trend over the period 2013 to 2022.



<sup>4</sup> The Annual G20 Scorecard – Research Performance 2020 | Clarivate. (n.d.). Academia and Government. <https://clarivate.com/academia-government/lp/the-annual-g20-scorecard-research-performance-2020/>



	Papers	CNCI	Collab CNCI	%>World average	% in top 10%
All Papers	869,981	0.89	0.81	25.7%	8.3%
Domestic Papers	572,752	0.63	0.73	19.3%	4.8%
International Papers	297,229	1.40	0.95	38.0%	15.0%
G20 total dataset	17,082,868	1.00	0.99	31.7%	10.7%



**Source** Web of Science

**Notes** Data were taken from Web of Science" using the Science Citation Index Expanded", Social Sciences Citation Index" and Arts & Humanities Citation Index", and only cover Articles and Reviews.

**Year** Data are from the period 2013 to 2022.

## 2. Regional collaboration: A missed opportunity?

**Additional research from ISI on the changing research landscape in the Middle East, North Africa and Turkey showed that, for many of the countries studied, international collaboration has taken up a significant portion of overall research output.<sup>5</sup>**

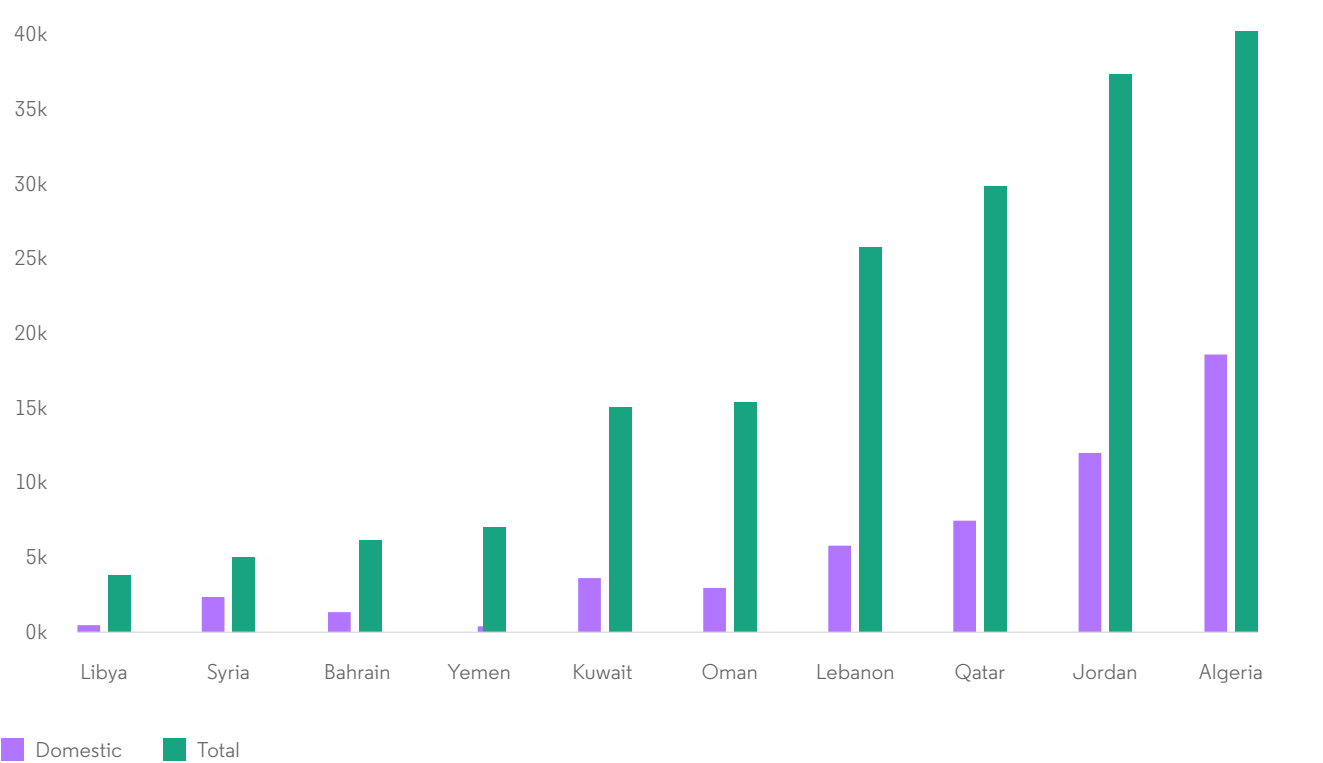
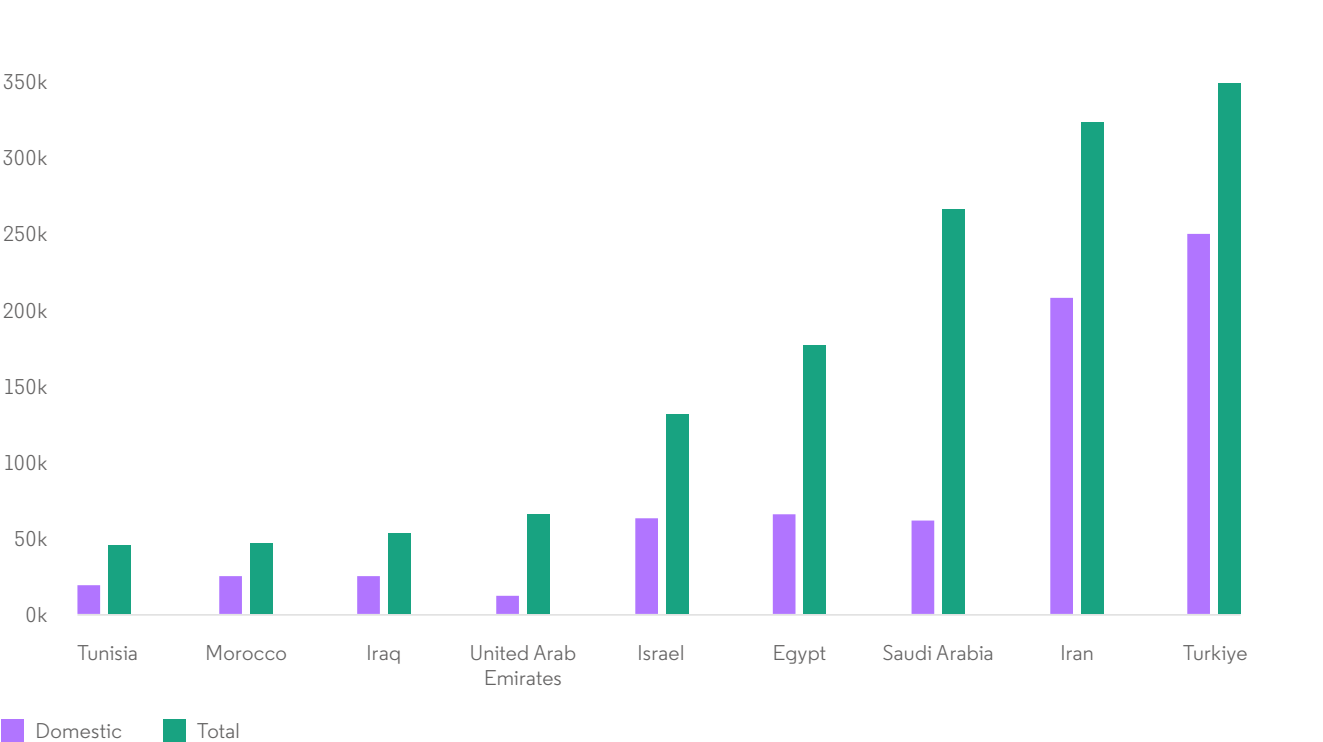
In some regional contexts where research ecosystems are rapidly expanding, only a few countries have a significant domestic research base underpinning their national innovation systems (Figure 3).

Limited regional collaborations could represent a missed opportunity to address specific issues affecting the region, particularly when major research nations serve as leading partners (Figure 3). More regional collaboration could also ensure diversity in topic focus and in the impacts of research on society.

<sup>5</sup>. Jouahi. (2024, July 5). The changing research landscape of the Middle East, North Africa and Turkey [Report] | Clarivate. *Academia and Government*. <https://clarivate.com/academia-government/blog/the-changing-research-landscape-of-the-middle-east-north-africa-and-turkey-report/>



Figure 3: Domestic and total research output in countries in the Middle East, North Africa and Turkey, 2020-2024.



### 3. Trading a global outlook for increased risk exposure at home

**The risk of deprioritizing local and regional issues in favor of a global outlook has risen as geopolitical and economic fractures deepen among countries.**

The over-dependency on foreign expertise is a concern for several political leaders around the world, one of which, European Commission President, Ursula von der Leyen, refers to “de-risking” by strengthening national research. Due to shifting global dynamics we may see a renewed emphasis on supporting opportunities for regional experts to develop domestic knowledge in strategic areas, such as technology. The risk of diverting resources from pressing national or regional issues should be weighed among potential benefits when considering international collaborations.

**Is there a shift from globalization to localization?**

Some recent localized impact has resulted from the U.S. Inflation Reduction Act (IRA)<sup>6</sup> and the European Chips Act<sup>7</sup>. These policies emphasize themes such as renewable energy and economic resilience, principles that are sustainable in content but are not explicitly framed within the global Sustainable Development Goals (SDG)<sup>8</sup>. Researchers must now showcase the localized and strategic impact of their work to appeal to public funders in the U.S. and EU. Nonetheless, we should not forget that sustainability does pay off at the end of the day. It makes sense to commit to it both from a climate perspective and a strategic one. For example, renewable energy sources not only help mitigate climate change but also reduce susceptibility to geopolitical disruptions, such as supply line interruptions or resource access constraints. This dual benefit illustrates the pragmatic value of sustainability.

Consider a scenario where a renewable energy project in the U.S. originally designed to be aligned with SDG 7, Affordable and Clean Energy, where the focus was on expanding renewable energy in underserved rural areas to promote global sustainability. However, in light of the U.S. Inflation Reduction Act (IRA), the project is reframed to emphasize domestic energy security, reduced reliance on volatile supply chains, and job creation in rural areas. The reframing is retaining the project’s core activities while underscoring how the benefits resonate with U.S. policymakers. This shift will make the project appealing for the IRA while still contributing to global sustainability goals. Whether framed as SDG 7 or inflation reduction, the result remains almost the same: more renewable energy and progress toward a greener future. Such practice showcases the value of flexible framing in research proposals.

<sup>6</sup> House, W. (2024, August 16). *FACT SHEET: Two Years In, the Inflation Reduction Act is Lowering Costs for Millions of Americans, Tackling the Climate Crisis, and Creating Jobs*. The White House. <https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2024/08/16/fact-sheet-two-years-in-the-inflation-reduction-act-is-lowering-costs-for-millions-of-americans-tackling-the-climate-crisis-and-creating-jobs/>

<sup>7</sup> *European Chips Act*. (n.d.). European Commission. [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-chips-act\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-chips-act_en)

<sup>8</sup> *THE 17 GOALS | Sustainable Development*. (n.d.). <https://sdgs.un.org/goals>

# Evidence-based decision-making for strategic collaborations.

## Making strategic research collaboration decisions.

While collaboration is well-trod territory for academic and industry researchers, it is critical that organizations approach collaborations strategically.

To accurately assess research impact and effectiveness of collaborations, the vast growth in international collaboration must be accounted for.

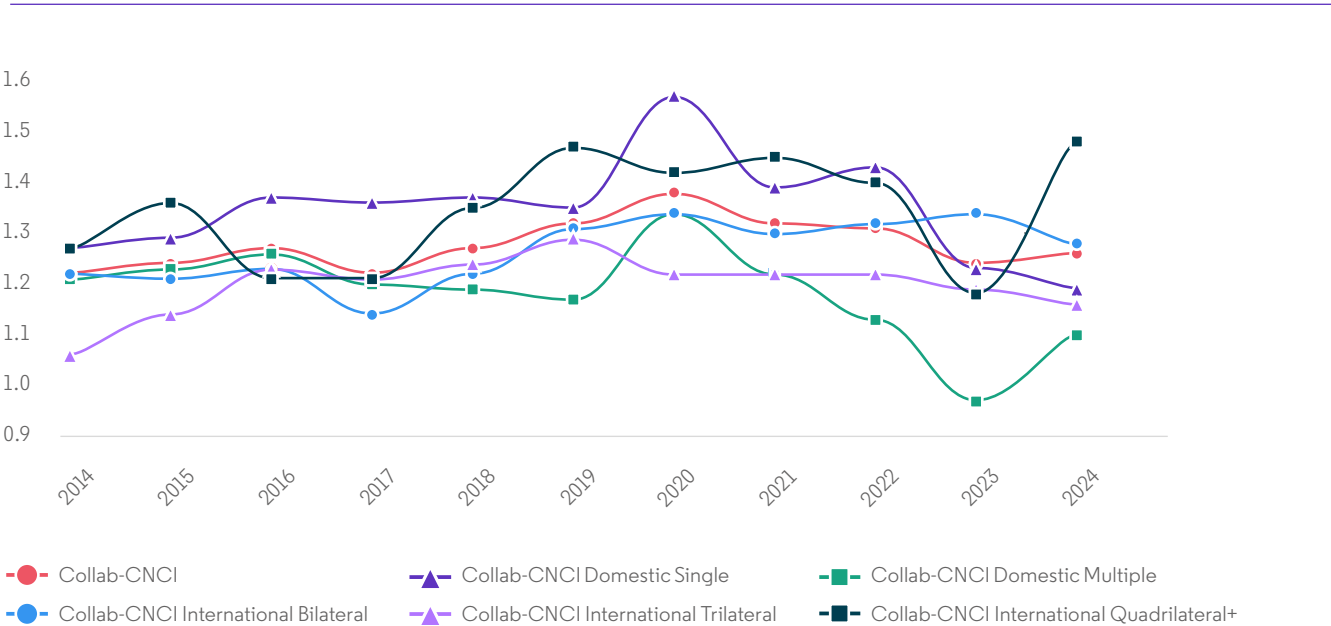
The Institute for Scientific Information developed (Collab-CNCI) as an approach for assessing impact that normalizes for collaborations. Collab-CNCI applies one additional step to normalize citation counts. Reference is made to document type, publication year, research area (as in standard CNCI (Category Normalized Citation Impact)), but also to collaboration type, distinguishing between domestic and international research.

By breaking down citation impact into collaboration types (see Fig. 4), analysts can see what is driving their performance. Strong domestic collaborations remain foundational for building a sustained local research environment. Large multinational (quadrilateral-plus) collaborations, while impactful, can be difficult to establish and maintain in the long run. Domestic and bi- or trilateral international collaborations often represent a more practical and reliable strategy for fostering long-term growth in citation impact. Understanding one’s strengths and weaknesses among these scenarios will allow research leaders to effectively foster long-term domestic sustainability and drive international impact.

For stakeholders seeking to analyze research impact, Collab-CNCI provides essential insights into how collaboration influences citation rates. International collaboration is a major driver of citation growth, often surpassing the impact of

domestic research output. This outcome might remain obscured without a thorough analysis of rich multidimensional data. There is a significant warning here: a failure to examine the broader implications of international collaboration data risks a research assessment manager being led down the wrong path. This lack of attention to the influence of collaboration on citations can result in inaccurate misguided conclusions and ineffective policy decisions. Breaking down publications and their Collab-CNCI by collaboration type enables research offices, funding organizations, and governments to analyze current collaboration patterns and refine their strategies.

Figure 4: Example of citation impact comparison by collaboration type.



# Developing strategic research collaborations.

Understanding existing research partnerships at your institution is key to effectively leverage collaborations.

Yet, it can be challenging to track and monitor collaborations across a large institution, especially when data availability depends on staff and student reports. It is often easy to track major partnerships, but difficult to capture all smaller-scale researcher-driven partnerships. For example, collaborations developed by graduate students often continue and broaden long after graduation, but data on such individual connections are difficult to develop and update.

Bibliometrics metadata from multi-author publications can complement data from faculty surveys or institutional reporting from universities to increase the accuracy and tracking of collaborations. To monitor and evaluate collaborative initiatives, the use of visual displays and dashboards built on data sources such as the Web of Science can allow academic institutions and governments to:

- map collaborations to individual or institutional strengths or areas of opportunity,
- assess collaboration networks against relevant benchmarks, and
- consider collaborations in regional and global contexts.

Figure 5 uses Japan as an example, and shows density of countries Japanese organizations have collaborated with between 2020-2024. Over 30% of research published by Japanese organizations had at least one international collaborator. Among the collaborating countries, Table 1 demonstrates the output and impact of collaborating researches, using number of documents in the Web of Science and the aggregated Collab-CNCI for country level collaboration. It shows that the U.S. and China Mainland were major collaborators for Japan. The high aggregated Collab-CNCI above 1 for all international collaborations shows that the research have above global average citation impact.

Figure 5: International collaboration heatmap for Japan between 2020-2024.

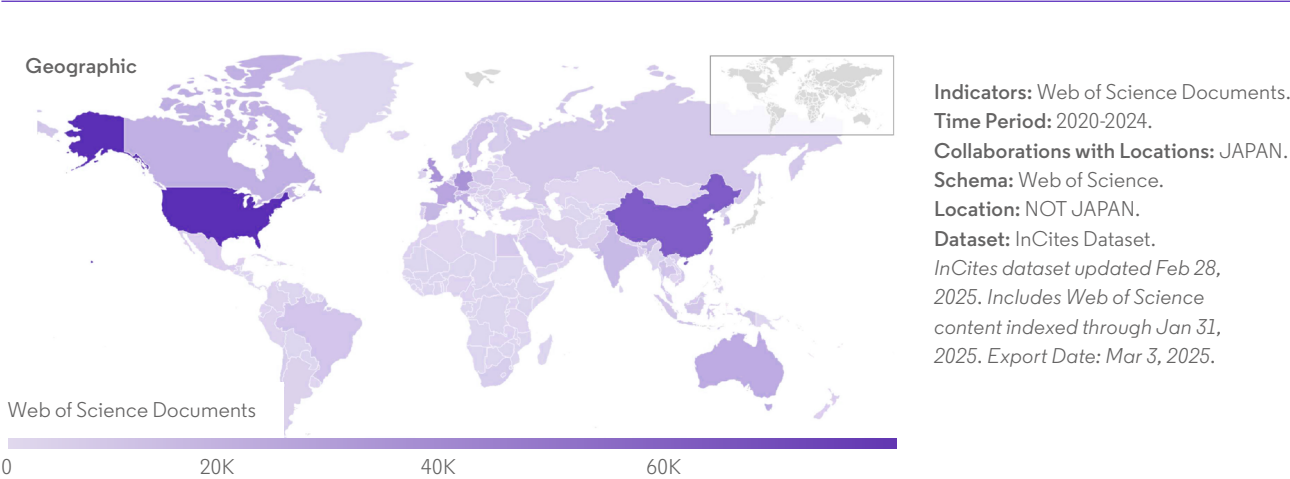


Table 1: Top 5 international collaborating countries for Japanese organizations, number of publications and aggregated Collab-CNCI.

Country/Region	Web of Science Documents	Collab-CNCI
U.S.	74173	1.26
China Mainland	53532	1.26
Germany (FED REP GER)	29846	1.41
United Kingdom	29768	1.52
France	21760	1.58

# Conclusion

## Enhancing partnerships while controlling risk

The benefits of international partnering are well-known; however, documentation of risks is less common. Leveraging intelligence about collaborations can help research managers ensure that collaboration strategies are aligned with their organization's mission to enhance the impact of their partnerships, while limiting their risks.

Bibliometric network analysis is an excellent way to understand opportunities for expanding collaborations. Published research combined with records of funding provide evidence of a potential collaborator's performance, expertise and resources. Comprehensive understanding of these data can enhance institutions' confidence in decision making to enhance their broader research strategy.

Speak to our Academia & Government Consulting team to learn how you can develop the right evaluation and management strategy for your organization's collaborations. Learn more about InCites Plus, which combines the skills of our Consulting team with the assessment tools in InCites Benchmarking & Analytics.

"By embracing this dual focus, researchers can secure funding and maintain progress toward addressing societal challenges, ensuring their work remains impactful and relevant in a fractured global environment."

## About Clarivate

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