



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

GOPA
WORLDWIDE CONSULTANTS

Rapid Evidence Review

How does support given to institutional systems that promote innovation contribute to innovation in production processes in middle income countries?

Commissioned by: SECO Economic Cooperation and Development

Authored by: Camille Massey (GOPA/Evaluet)

Reviewed by: Dr. Susanne Johanna Väh (CEval)

July 2026 - No. 4



In association with:

CEvalGmbH

\ ABSTRACT

Background / Objective

Most middle-income countries (MICs) – in which a majority of the world population resides – have not succeeded in conducting a manufacturing-led structural transformation achieved in countries such as China. They experience a “middle-income technology trap” in this domain: despite initial boosts to manufacturing output, institutions and capital do not drive industrial and technological changes desirable for their development ambitions. Support to institutional systems that promote innovation is therefore a highly relevant target for development partnerships.

This review synthesises evidence from 49 studies to understand how support can improve innovation prospects. It also delves into the institutional mechanisms that drive innovation, to understand the levers and entry points that SECO could target to optimise outcomes.

Evidence Summary / Key Findings

The review finds that:

- **At the macro scale, external support can drive Science, Technology and Innovation (STI) in MICs, but the nature and magnitude of the effect is disputed.**
- **The degree to which the efforts aimed at strengthening innovation systems actually boost productive innovation in MICs is conditioned by interacting factors**, such as human capital, university-industry linkages, technology transfer, the enabling environment, and the existence and structure of the Innovation Support Centres.
- **A country's income level shapes where support can make the biggest difference.** Knowledge absorption is a priority for most lower middle-income countries (LMICs). Knowledge creation becomes a greater priority for most upper middle-income countries (UMICs).

Strength of Evidence / Gaps

International interventions support innovation systems. But those who implement these activities rarely track the outcomes adequately. This represents a key limitation of the review.

No high-quality evaluation of donor/multilateral programmes supporting innovation has been published, so it is hard to credibly determine success factors. Yet, a considerable volume of peer-reviewed evidence exists for each particular institutional mechanism explored in this RER, each large enough to warrant a separate evidence review. The focus of innovation-related topics highly varies and the extent of academic publications across the world on this topic creates a considerable and diffuse literature base, which was hardly possible to synthesise in the short period of time devoted to an RER.

One of the obstacles to generating quantified, global evidence on the relationship between innovation support and innovation outcomes is that statistical classification of “Science, Technology and Innovation (STI) ODA” does not exist and thus statistical country-level STI ODA data is lacking.

Conclusion / Implications

Innovation support programmes can clearly improve elements of the institutional systems that support innovation. Evidence shows that interventions can strengthen the determinants of innovation: human capital, policy support, and support to innovation centres and their networks. The extent to which this support ultimately drives technological innovation, however, is not clear.

A shortage of contextually tailored interventions in this field is observable. Therefore, interventions should factor in the heterogeneity of innovation ecosystems, and recognise that different country income levels and development paths have different support priorities.

The opportunity exists to lead the way on strong outcome monitoring practices and deploy them in future interventions, to shed light on the effectiveness, strengths and weaknesses of international programming in innovation support.

\ CONTENTS

\	ABSTRACT.....	I
1	ANALYSIS.....	1
1.1	INTERNATIONAL SUPPORT TO INNOVATION SYSTEMS RARELY TRACKS ITS OUTCOMES ADEQUATELY	1
1.2	EXTERNAL SUPPORT DOES APPEAR TO DRIVE SCIENCE, TECHNOLOGY AND INNOVATION (STI) IN MICS, BUT THE EXTENT AND NATURE OF THE RELATIONSHIP IS DISPUTED	1
1.3	MULTIPLE FACTORS CONDITION THE IMPACT OF INNOVATION SYSTEM STRENGTHENING ON PRODUCTIVE INNOVATION	2
1.3.1	LEVER 1: HUMAN CAPITAL CAPACITY BUILDING	2
1.3.2	LEVER 2: UNIVERSITY-INDUSTRY LINKAGES	3
1.3.3	TECHNOLOGY TRANSFER.....	3
1.3.4	ENABLING ENVIRONMENT (POLICY, INTELLECTUAL PROPERTY, AND RULE OF LAW)	3
1.3.5	INNOVATION SUPPORT CENTRES.....	4
1.4	THE LEVEL OF INCOME OF A COUNTRY DICTATES THE HIGHEST PRIORITY LEVERS OF SUPPORT. KNOWLEDGE ABSORPTION IS A PRIORITY FOR LMICS. KNOWLEDGE CREATION BECOMES A GREATER PRIORITY FOR UMICS.	5
2	RELIABILITY OF EVIDENCE AND GAPS.....	6
\	ABOUT THIS EVIDENCE REVIEW	8
\	ABOUT THE RAPID EVIDENCE REVIEWS	10

1 ANALYSIS

1.1 INTERNATIONAL SUPPORT TO INNOVATION SYSTEMS RARELY TRACKS ITS OUTCOMES ADEQUATELY

Credible assessments of the experiences, successes and failures of international actors in fostering innovation are central to understanding how support given to institutional systems promotes innovation in MICs.

However, the evaluation quality of donor and international actor programmes is often weak and blurs the assessment of the impact of external support to innovation in MICs. Evaluations rarely track long-term, ecosystem-level outcomes such as sustained increases in national R&D, innovation outputs, or durable changes in networks. Even positive project evaluations focus on near-term capacities and models, not on long-horizon system transformation.^{1 2 3} Indicators are often weak or self-reported (e.g., “knowledge increased,” “awareness”) and criticized in some of the reviewed literature as not sufficiently specific or objectively measurable.

A conclusion of an older World Bank strategic, global review remains valid, which underscores that, despite large investments in innovation and entrepreneurship, more systemic efforts, clear results frameworks, and strong monitoring and evaluation are needed to understand and scale effective approaches.⁴ An evaluability assessment of the United Nations Industrial Development Organization’s (UNIDO) contribution to SDG 9 (“Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”) concluded that the topic was not evaluable due to inadequate results-based management architecture.⁵

Due to the dearth of sound evaluative information on the performance of external support for innovation systems, the review focuses on the conditioning mechanisms that drive innovation in MICs, integrating any evaluative evidence wherever possible.

1.2 EXTERNAL SUPPORT DOES APPEAR TO DRIVE SCIENCE, TECHNOLOGY AND INNOVATION (STI) IN MICS, BUT THE EXTENT AND NATURE OF THE RELATIONSHIP IS DISPUTED

At the macro scale, sparse literature quantifying the effect of STI-focused ODA on innovation outcomes tentatively concurs that a relationship exists, but evidence is insufficient to make confident judgements on its extent and direction. A lack of data inhibits robust quantification of innovation-focused ODA. STI ODA has rarely been empirically studied because it is not clearly classified statistically, and country-level STI ODA data are not compiled by the World Bank, OECD, or other international organisations.

One econometric study found that, across 79 middle-income countries, recent increases in development assistance helped predict short-term increases in innovation. In turn, higher innovation levels are associated with improvements in institutional quality, which then draw in development assistance.⁶ Another study found that STI ODA alone does not raise innovative capacity, but becomes effective when recipient country research and development (R&D) investment is sufficiently high, highlighting the importance of domestic buy-in and absorptive capacity.⁷

¹ Haarsager, U.; Barbosa, F.; De Santis, S.; Putic, M.; Hoekman, F.; Michelitsch, R.; (2021). Evaluation of IDB LAB: Evaluation of Operations and Summary of Findings

² Ternström, I., Stolyarenko, K., Kastrati, L., Siegler-Lathrop, N. (2026). Decentralised Evaluation of Sida Core Support Programme to Innovation Centre Kosovo; Swedish International Development Agency

³ Condes, O. (2019). Final Evaluation of the Innovation Partnership Programme, IPP (Phase II), Finnish Ministry of Foreign Affairs.

⁴ World Bank Group (2014). World Bank Group support for innovation and entrepreneurship : an independent evaluation (English). Sector or thematic evaluation Washington, DC : World Bank Group.

⁵ Office of Evaluation and Internal Oversight (2024). Evaluability Assessment: UNIDO’s contribution to SDG9.

⁶ Pradhan, R., Arvin, M. B., Nair, M., & Bennett, S. E. (2023). Does foreign aid affect innovation and institutional quality in middle-income countries?. *Evaluation and program planning*, 100, 102340. <https://doi.org/10.1016/j.evalprogplan.2023.102340>

⁷ Choi, H.-M., & Cho, K.-T. (2023). Effects of Science, Technology, and Innovation Official Development Assistance on Innovative Capacity in Developing Countries. *Sustainability*. <https://doi.org/10.3390/su15042906>

1.3 MULTIPLE FACTORS CONDITION THE IMPACT OF INNOVATION SYSTEM STRENGTHENING ON PRODUCTIVE INNOVATION

A growing body of research highlights the key ‘levers’ available to enable innovation systems to foster productive innovation in MICs. Across MICs and LMICs, external programmes can strengthen innovation-related systems when they:

- Build human capital;⁸
- Support research capacity and university-industry linkages;⁹
- Enable and harness technology transfer;¹⁰
- Support and align with the local enabling environment,¹¹ and
- strengthen innovation centres, intermediaries or consortia.¹²

Where these conditions are absent, effects are weaker, not sustained, or limited to pilots rather than systemic change.^{13, 14} The following sections explore the most prevalent factors highlighted by the research, exploring how they affect the prospects of innovation, and the success of programmes in supporting relevant institutions.

1.3.1 LEVER 1: HUMAN CAPITAL CAPACITY BUILDING

Human capital is the foundation of innovative capacity in any economy. Educational attainment and targeted education reforms are critical for building national innovation capacity.^{15, 16} Absorptive capacity - the ability to acquire/adapt external knowledge - is essential for bridging the gap between current innovation capacity and the global frontier, and requires strong human capital.¹⁷ To improve absorptive capacity, skilled labour (workers who have completed higher education) is seen as a crucial determinant of innovation, whereas high-skilled labour (number of full-time R&D personnel as a proportion of the population) is a key driver of innovation-led growth.¹⁸

Donor/international actor contribution-focused evaluations show success in strengthening local capacities for research, with some evidence of capacity gains translating into innovative outputs. For example, externally financed programmes such as the UK-funded Africa Capacity Building Initiative created consortia between African and UK institutions, resulting in 38 PhD graduates, strengthened labs and high-quality scientific outputs across 18 African countries.¹⁹ Similarly, a World Health Organisation Career Development Fellowship programme for researchers from LMICs noted that the programme filled crucial knowledge gaps, and translated into some (albeit poorly tracked) institutional improvements in home countries.²⁰ Beyond universities, a GIZ-funded TVET and inclusive business project in Indonesia engaged 84 companies in skill development, with interviewees indicating positive effects on technical and soft skills and transfer into production processes.²¹

⁸ Engelman, R., Fracasso, E., Schmidt, S., & Zen, A. (2017). Intellectual capital, absorptive capacity and product innovation. *Management Decision*, 55, 474-490

⁹ Hojeij, Z. (2024). An overview of university-industry collaboration in the Arab world. *Journal of Innovation and Entrepreneurship*, 13, 1-16

¹⁰ Burns, A. (2009). Technology diffusion in the developing world. *OECD Innovation and Growth: Chasing a Moving Frontier*. 169-202.

¹¹ Usman, M., Shabbir, R., Bhutta, A., Ahmad, I., & Zubair, A. (2021). Corporate innovation in developing countries: role of legal institutions and property rights protection. *Foresight*.

¹² Shafi, M., Sarker, M. N. I., & Liu, J. (2019). Social Network of Small Creative Firms and Its Effects on Innovation in Developing Countries. *SAGE Open*, 9.

¹³ Maher, D., Aseffa, A., Kay, S., & Bayona, M. T. (2020). External funding to strengthen capacity for research in low-income and middle-income countries: exigence, excellence and equity. *BMJ Global Health*, 5

¹⁴ Spicer, N., Hamza, Y., Berhanu, D., Gautham, M., Schellenberg, J., Tadesse, F., Umar, N., & Wickremasinghe, D. (2018). ‘The development sector is a graveyard of pilot projects!’ Six critical actions for externally funded implementers to foster scale-up of maternal and newborn health innovations in low and middle-income countries. *Globalization and Health*, 14.

¹⁵ Dallakyan, S., Makaryan, A., Isanians, V., Mkrtchyan, H., Sargsyan, H., Tovmasyan, G., & Bilan, S. A. (2025). Policy priorities for improving Global Innovation Index score and innovative performance in upper-middle-income countries: Implications for Armenia. *Problems and Perspectives in Management*.

¹⁶ Engelman, R., Fracasso, E., Schmidt, S., & Zen, A. (2017). Intellectual capital, absorptive capacity and product innovation. *Management Decision*, 55, 474-490

¹⁷ Khan, M. S. (2022). Absorptive Capacities Approaches for Investigating National Innovation System in Low and Middle Income Countries. *International Journal of Innovation Studies*.

¹⁸ Ngo, H. P. T. (2023). Human Capital for Innovation Capacity in Middle-Income Economies. *International Journal of Economics and Finance*.

¹⁹ Catlow, C. R. A., & Pickett, J. A. (2024). Science and innovation in Sub-Saharan Africa: an introduction. *Interface Focus*, 14.

²⁰ Käser, M., Maure, C., Halpaap, B., Vahedi, M., Yamaka, S., Launois, P., & Casamitjana, N. (2016). Research Capacity Strengthening in Low and Middle Income Countries – An Evaluation of the WHO/TDR Career Development Fellowship Programme. *PLoS Neglected Tropical Diseases*, 10.

²¹ Jacoby, K.-P. (iSPO GmbH); Susilowati, I. (2022). Innovation and Investment for Inclusive Sustainable Economic Development (ISED), Indonesia Project number 2015.2112.9. GIZ Centralised Evaluation Report.

1.3.2 LEVER 2: UNIVERSITY-INDUSTRY LINKAGES

Strong linkages between industry and research institutions boost productive outcomes.²² Universities and research institutions, working with industry and often government, generate concrete innovation outputs: new products and processes, patents and startups, sectoral technologies, and social innovations.²³ Several case studies from across the Arab world and Latin America attest to the growing centrality of university-industry collaboration in driving growth and development by spurring innovation through joint research and encouraging entrepreneurship.^{24, 25}

Evaluative evidence of donor support to university-industry partnerships reveals mixed results, and innovation-specific outcomes were often poorly tracked. The Strategic Evaluation of World Bank support to Higher Education indicates mixed effectiveness of projects in strengthening university-industry links. Projects implemented in Uganda and Kazakhstan clearly contributed to collaboration with the private sector, whereas a university-private project in Chile was deemed to have “a weak impact on research and development and limited contribution to developing capacity in science and technology”. The same evaluation assessed several research grants prioritising areas of competitiveness, again finding mixed impact, with a limited uptake of technology resulting from grants in Uganda.²⁶

1.3.3 TECHNOLOGY TRANSFER

Innovation and technology catch-up in low-income countries and MICs relies heavily on international technology transfer, imitation, absorption, and FDI, especially where domestic R&D resources are limited.²⁷ Cross country work shows that access to foreign technology plus domestic absorptive capacity (skills, finance, regulation, proactive policies) determines how far transferred technologies are actually embedded in firms’ production processes.²⁸ This is supported by case study examples from Ethiopia and Sri Lanka, which attest to the importance of foreign technology transfer in enhancing innovation prospects.²⁹ Technology can also be transferred domestically, from research institutes to the private sector. Examples from Kenya and Azerbaijan highlight that technology transfer from universities (spillovers, networking, incubators/accelerators) significantly improves manufacturing firms’ innovation performance, implying upgraded production capabilities.^{30, 31}

1.3.4 ENABLING ENVIRONMENT (POLICY, INTELLECTUAL PROPERTY, AND RULE OF LAW)

Strong rule of law and (intellectual) property rights protection increase firms’ willingness to innovate. They do so by ensuring disputes are resolved and innovations are protected, reducing fear of imitation and expropriation. Across studied countries, functional legal institutions and protected property rights are associated with higher corporate innovation.³² In China and Africa, better rule of law significantly raises firms’ propensity to innovate.^{33,}

³⁴

²² Langa, W., Mkwambisi, D., & Dougill, A. (2025). Systematic Review of Open Innovation Approaches for Industrialisation in Developing Economies. *Foresight and STI Governance*.

²³ Lianto, B., & Iswadi, H. (2025). University-Industry Collaboration and Innovation Performance Evidence from the University of Surabaya in Indonesia. *The Asian Journal of Technology Management (AJTM)*.

²⁴ Hojeij, Z. (2024). An overview of university-industry collaboration in the Arab world. *Journal of Innovation and Entrepreneurship*, 13, 1-16

²⁵ OECD/IDB (2022). Innovative and Entrepreneurial Universities in Latin America, OECD Skills Studies, OECD Publishing, Paris

²⁶ World Bank Independent Evaluation Group (2017). Higher Education for Development: An Evaluation of the World Bank Group’s Support

²⁷ Pandey, N., De Coninck, H., & Sagar, A. (2021). Beyond technology transfer: Innovation cooperation to advance sustainable development in developing countries. *Wiley Interdisciplinary Reviews: Energy and Environment*, 11.

²⁸ Burns, A. (2009). Technology diffusion in the developing world. *OECD Innovation and Growth: Chasing a Moving Frontier*. 169-202.

²⁹ Malik, K. and Wickramasinghe, V. (2013). “International technology transfer and its impact on innovation enhancement for firms based in Sri Lanka”, *International Journal of Technology Transfer and Commercialization*, Vol. 12 Nos1/2/3, pp. 13-21

³⁰ Gachanja, I. (2022). Influence of Technology Transfer From Universities On Manufacturing Firms’ Innovative Performance. *International Journal of Innovation Studies*.

³¹ Abdurazzakov, O., Illés, B., Jafarov, N., & Aliyev, K. (2020). THE IMPACT OF TECHNOLOGY TRANSFER ON INNOVATION. *Polish Journal of Management Studies*.

³² Usman, M., Shabbir, R., Bhutta, A., Ahmad, I., & Zubair, A. (2021). Corporate innovation in developing countries: role of legal institutions and property rights protection. *Foresight*.

³³ Hussien, M., & Çokgezen, M. (2020). The impact of regional institutional quality on firm innovation: evidence from Africa. *Innovation and Development*, 11, 69 - 90.

³⁴ Rodríguez-Pose, A., & Zhang, M. (2020). The cost of weak institutions for innovation in China. *Technological Forecasting and Social Change*.

However, the literature warns against the effects of intellectual property regulations. Excessively strict patent enforcement or burdensome regulations can have negative effects on less innovative economies.³⁵ Very strict intellectual property regulations can harm product and process innovation in resource and skill-constrained industries, while helping R&D in sectors with strong capacity.^{36, 37}

Historically, industrial policy which protects strategic domestic industries from competition has helped countries overcome the “middle-income technology trap”.³⁸ Government support and funding facilities, implementation of dedicated agencies/clusters, and long-term systemic approaches are highlighted steps on a pathway towards innovation capability.³⁹ However, the interplay between state action and private sector actors is crucial; weak coordination or timid policies without clear “mission-oriented” focus on innovation fail to generate domestic innovative capacity or protect strategic industries from external competition.⁴⁰ A case study from Chile highlights a lack of leadership from the government, characterised by a lack of coordination between government agencies and ministries for budget allocation and strategy definition, as a key inhibiting factor for the success of innovation support programmes.⁴¹ Other studies highlight that subsidies may sometimes be misaligned with SME needs or even have negative impacts if not well-targeted.⁴²

Few evaluations study efforts to improve the enabling environment – those that do point to tentative successes of development banks in MICs. Notably, two projects implemented by the Asian Development Bank (ADB) contributed to revision and updating of industrial policy and legal frameworks for intellectual property regulation. In Armenia, technical assistance helped revise the industrial policy results framework and build a research program in the Ministry of Economy to support industrial and innovation policies, including an impact assessment of a creative technologies centre.⁴³ In Mongolia, studies mapped STI institutions, assessed data systems and intellectual property legal frameworks, and ADB-recommended amendments were adopted by the government. The policy on priority areas for innovation was approved by the cabinet.⁴⁴ The longer-term impacts of this institutional and technical support were not tracked.

1.3.5 INNOVATION SUPPORT CENTRES

Industry associations, innovation accelerators, and related intermediaries in middle-income countries affect innovation through the following channels:

- **Network formation:** In MICs, innovation tends to improve when firms gain access to structured external networks, but the value of those networks depends on connecting the key entities (e.g., innovative firms and universities, firms and state/domestic financing institutions, buyers and sellers). These network effects enabled small firms in Bangladesh to benefit from cooperative ties with buyers, suppliers, and designers.⁴⁵
- **Capability building:** Accelerators appear to improve innovation mainly by combining idea and product validation, product development support, and market-access support as core accelerator mechanisms.⁴⁶

Specific studies caution against industry associations which involve the state. A study focused on China found that close engagement with intermediaries (e.g., industry associations) can result in regulatory pressure that constrains firms’ flexibility/innovativeness, especially where institutional development is uneven.⁴⁷

³⁵ Sharma, A., Sousa, C., & Woodward, R. T. (2022). Determinants of innovation outcomes: The role of institutional quality. *Technovation*.

³⁶ Rosemberg, C., Potau, X., Leistner, S., Dijkstal, F., Vinnik, A., Tiriduzzi, C., Dave, A., & Blind, K. (2020). *Regulatory Sandboxes and Innovation Testbeds: A Look at International Experience in Latin America and the Caribbean*. <https://doi.org/10.18235/0002526>

³⁷ Abidin, J., Sharma, A., Trivedi, R. H., & Wang, C. (2024). Financing constraints, intellectual property rights protection and incremental innovation: Evidence from transition economy firms. *Technological Forecasting and Social Change*.

³⁸ Andreoni, A., & Tregenna, F. (2020). Escaping the middle-income technology trap: A comparative analysis of industrial policies in China, Brazil and South Africa. *Structural Change and Economic Dynamics*.

³⁹ Novillo-Villegas, S., Acosta-Vargas, P., Cruz-Boada, C., Garzon, M., Marin-Dett, A., & Anzules-Falcones, W. (2022). Sustaining the Path for Innovation Capability from a Developing Country Perspective: A Conceptual Framework. *Sustainability*.

⁴⁰ Kang, N., & Paus, E. (2019). The Political Economy of the Middle Income Trap: The Challenges of Advancing Innovation Capabilities in Latin America, Asia and Beyond. *The Journal of Development Studies*, 56, 651 - 656.

⁴¹ Saporito, N. F., Moreira, J. d. F. W., Penna, C. C. R., & Radaelli, V. (2021). *Upgrading Institutional Capacities in Innovation Policy in Chile: Choices, Design, and Assessments*. IDB

⁴² Koura, A., Oudgou, M., & Boudhar, A. (2025). Impact of financial support on the intensity of innovation practices within SMEs – Case of Morocco. *Africa Journal of Management*, 11, 371 - 396.

⁴³ Obias, P (2020). Armenia: Export- and Innovation-Led Industrial Development. Asian Development Bank Independent Evaluation

⁴⁴ Mongcopa, C.J. (2023) Mongolia: Strengthening Systems for Promoting Science, Technology, and Innovation. Asian Development Bank Independent Evaluation

⁴⁵ Shafi, M., Sarker, M. N. I., & Liu, J. (2019). Social Network of Small Creative Firms and Its Effects on Innovation in Developing Countries. *SAGE Open*, 9.

⁴⁶ Aljalalima, J., & Slof, J. (2022). An Updated Systematic Review of Business Accelerators: Functions, Operation, and Gaps in the Existing Literature. *Journal of Open Innovation: Technology, Market, and Complexity*.

⁴⁷ Yao, N., Guo, Q., & Tsinopoulos, C. (2022). The bright and dark sides of institutional intermediaries: Industry associations and small-firm innovation. *Research Policy*.

Reports found that networks of Innovation Centres supported by international actors have strong innovation prospects, though the extent to which support contributes to positive changes has not been evaluated. The World Intellectual Property Organization (WIPO) provides staff certification, training in patents, policy, technology transfer and analytics, as well as product development support to a growing network of 1667 centres in 93 countries. This network of Technology and Innovation Centres is clearly an engine for patent and other IP rights applications – a proxy for domestic innovation activity. Amongst widespread progress, the following achievements of the network stand out:

- “In the Philippines, [Technology and Innovation Support Centres (TISCs)] achieved an all-time high record of 2,257 IP filings, including 439 patents, 651 utility models, 346 industrial designs, 150 trademark registrations and 671 copyright registrations. TISCs accounted for 42.83% of total resident IP filings, underscoring their significant contribution to the country’s innovation ecosystem. [...]”
- “In Kazakhstan, TISCs have contributed to a 15-percent increase in national patent applications and enhanced the quality of filings. A consistent rise in inventive activity was recorded nationwide, with Almaty and Astana achieving the highest inventive activity coefficients.”⁴⁸

1.4 THE LEVEL OF INCOME OF A COUNTRY DICTATES THE HIGHEST PRIORITY LEVERS OF SUPPORT. KNOWLEDGE ABSORPTION IS A PRIORITY FOR LMICS. KNOWLEDGE CREATION BECOMES A GREATER PRIORITY FOR UMICS.

With noted variance⁴⁹, middle-income countries at different stages of development typically have different priorities when developing innovation capacity.

- Lower-middle-income countries: A shortage of human capital for R&D is a particularly major bottleneck in lower-middle-income countries.⁵⁰ Innovation in low- and middle-income countries is often framed as “catching up”, centred on technological absorption, diffusion, and incremental innovation of existing technology from abroad rather than frontier invention.^{51, 52, 53} In transition economies, knowledge absorption, rather than creation, is the strongest predictor of innovation performance.⁵⁴
- Upper-middle-income countries: The challenge shifts toward innovation-led growth. UMIC growth is increasingly tied to latent innovation capabilities and the transition from imitation to innovation. To do so, UMICs also benefit from more very high-skilled human capital, R&D capital stock, and import-embodied R&D spillovers: a blend of adaptation and more advanced domestic capability-building.^{55, 56}

⁴⁸ WIPO (2025). Building Skills to Support Innovation. TISC Report 2024.

⁴⁹ Khan, M., Kugler, M., & Smith, C. A. (2026). Invention complexity, latent innovation capabilities, and economic development in upper middle-income countries. *Technological Forecasting and Social Change*.

⁵⁰ Bate, A. F., Wachira, E., & Danka, S. (2021). The determinants of innovation performance: an income-based cross-country comparative analysis using the Global Innovation Index (GII). *Journal of Innovation and Entrepreneurship*, 12, 1-27.

⁵¹ Khan, M. S. (2022). Absorptive Capacities Approaches for Investigating National Innovation System in Low and Middle Income Countries. *International Journal of Innovation Studies*.

⁵² Casadella, V., & Tah, S. (2022). National Innovation Systems in Low-Income and Middle-Income Countries: Re-evaluation of Indicators and Lessons for a Learning Economy in Senegal. *Journal of the Knowledge Economy*, 1 - 31.

⁵³ Bar-El, R., & Maymoni, L. (2025). How can lower-income countries integrate in the innovation-led global economy?. *International Journal of Innovation Studies*.

⁵⁴ Robertson, J., Caruana, A., & Ferreira, C. C. (2021). Innovation performance: The effect of knowledge-based dynamic capabilities in cross-country innovation ecosystems. *International Business Review*, 101866.

⁵⁵ Ngo, H. P. T. (2023). Human Capital for Innovation Capacity in Middle-Income Economies. *International Journal of Economics and Finance*

⁵⁶ Bongers, A., Díaz-Roldán, C., & Torres, J. L. (2022). Highly Skilled International Migration, STEM Workers, and Innovation. *Economics*, 16, 73 - 89.

2 RELIABILITY OF EVIDENCE AND GAPS

The evidence quality associated with each finding in this review is summarized below:

CLAIM	EVIDENCE STRENGTH	REASONING
1. International support to innovation systems rarely tracks its outcomes adequately.	Strong	Strong consensus from strategic, portfolio, and project-specific evaluations from donors, UN agencies and Multilateral Development Banks.
2. External support can drive Science, Technology and Innovation (STI) in MICs, but the extent and directness of the relationship is disputed.	Weak	Few correlative quantitative studies of STI ODA and related indices do not have a universal definition by the World Bank, and country-level data is of variable quality.
3. The impact of innovation system strengthening on productive innovation in MICs is conditioned by multiple interacting factors	Strong	Strong consensus, with quantitative studies and systematic reviews arriving at similar mappings of crucial factors.
3a. Human capital is a prerequisite for building innovation capacity in middle-income countries.	Strong	Strong consensus from varied, geographically diverse, highly cited literature.
3b. Strong linkages between industry and research institutions boost productive outcomes	Strong	Strong consensus from varied, geographically diverse, highly cited literature.
3c. Developing-country catch-up relies heavily on international technology transfer, imitation, absorption, and FDI, especially where domestic R&D resources are limited.	Moderate	Strong consensus from varied, geographically diverse, highly cited literature. No highly relevant evaluative evidence.
3d. Strong rule of law and property rights protection increase firms' willingness to innovate. However, the literature warns against the effects of intellectual property regulations.	Moderate	Strong consensus from varied, geographically diverse, highly cited literature. Limited dedicated evaluative evidence.
3e. Historically, industrial policy which protects strategic domestic industries from competition has helped countries to overcome the "middle-income technology trap". However, the interplay between state action and private sector actors is crucial.	Strong	Strong consensus from varied, geographically diverse, highly cited literature.
3f. Industry associations, innovation accelerators, and related intermediaries in middle-income countries affect innovation through improving networks and capabilities. Specific studies caution against industry associations.	Moderate	Strong consensus from varied, geographically diverse, highly cited literature. Statement on industry associations comes from numerous studies focused solely on the Chinese context.
4. With variance, the income level of a country dictates the valid entry points for support.	Strong	Strong consensus from varied, geographically diverse, highly cited literature.

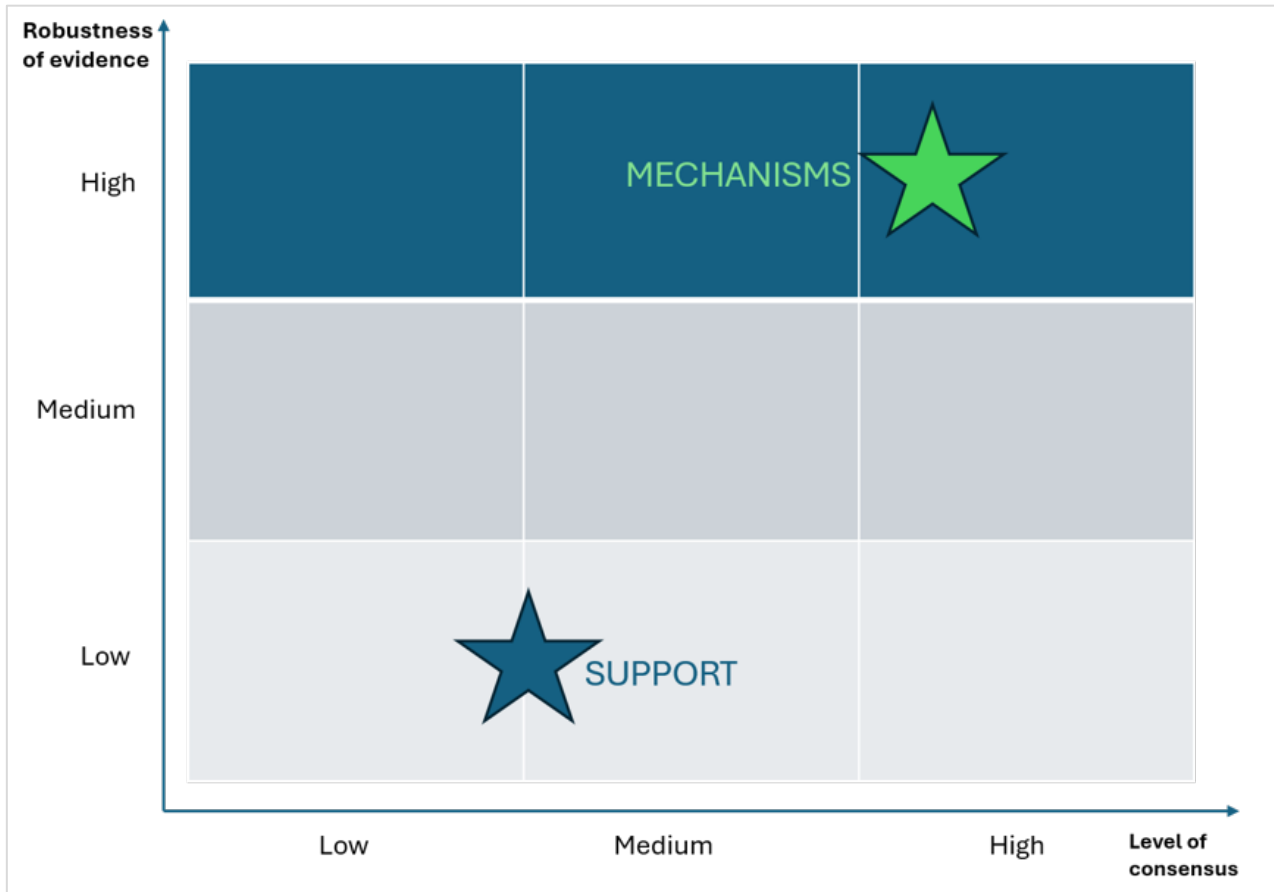
This rapid review encountered the following limitations which are important to note for accurate interpretation:

The lack of high-quality evaluative evidence of donor/multilateral programmes limits insights on success factors for interventions. As stated in the review, specialised international actors in innovation support – the World Bank, IDB, ADB, UNIDO, etc., - all commissioned evaluations that heavily criticised the monitoring practices. Few evaluations were able to track results beyond outputs, let alone attribute outcomes to their interventions. The manual search for evaluations was complicated by the fact that the question terms ("support to institutional systems that support innovation") rarely featured in evaluation titles. The lack of unified repository for this information dramatically increased search time.

Innovation is a polysemic, umbrella topic, and the extent of academic literature across the world naturally results in a large, diffuse literature base. This breadth explains the larger number of citations and resulted in a more cumbersome review. Efforts to refine the question, by focusing on innovation in production processes, were ultimately unsuccessful in narrowing the scope, as broader innovation in science and technology were mostly inseparable from production. Whilst evaluative evidence was lacking, each institutional mechanism/factor – human capital, university-industry linkages, etc., – warrants an individual Rapid Evidence Review.

Few sources explore the nature and extent of the relationship between innovation-focused development assistance and innovation outcome indicators. Quantified, global evidence on the relationship between innovation support and innovation outcomes is hampered by the lack of statistical classification of “STI ODA”, and a lack of country-level STI ODA data.

In sum, there were excessive, high-quality studies focused on the mechanisms: what makes institutional systems that support innovation work well. In contrast, high-quality evaluations or studies were scarce, resulting in weak, often inconclusive evidence on the effectiveness of donors’/international actors’ contribution to innovation in MICs.



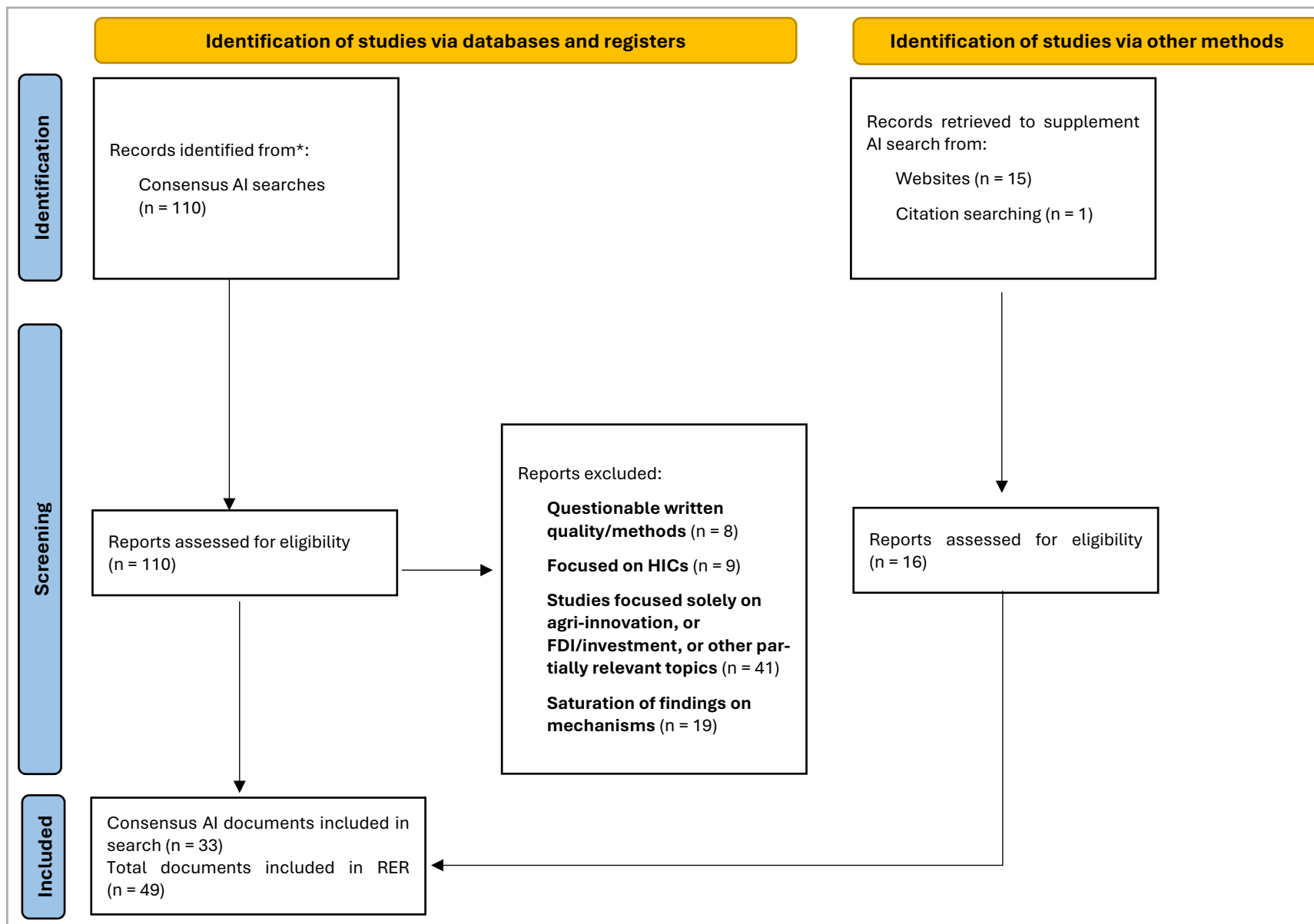
\ ABOUT THIS EVIDENCE REVIEW

The evidence review was prepared using a cascading approach, based on harvesting database suggestions through Consensus AI and widening the scope through academic databases Google Scholar and JSTOR. A widespread manual review of grey literature was conducted, focusing on key actors identified in the literature – the World Bank, OECD, WIPO, ADB, IDB, UNIDO, SIDA, FCDO, GIZ and the Finnish MFA.

The summary by Consensus AI and summaries from the 49 relevant papers were then reviewed. Four additional Consensus AI searches were performed to explore key sub-themes related to innovation, including technology transfer, attempting to prompt the application to focus on international/donor support to institutions that support innovation. It became clear that the application had very limited coverage of key grey literature evaluative evidence and studies on the effectiveness of international support in this area.

To fill this critical gap, keyword searches were deployed on the evaluation and publication databases of the World Bank, SIDA, ADB, NORAD, Finnish MFA, FCDO, Irish Aid, IMF, GIZ, UNIDO, UNCTAD, IDB, AfDB, DG INTPA, OECD, WIPO, and ITU. These organisations were chosen based on reviewer knowledge of the area, in combination with reviews of citations in the peer-reviewed literature. In total, 16 evaluations, studies and reports were sourced from these searches.

The effort was made to have broad geographic representation. Research papers covered the following geographic scopes: worldwide quantitative analyses and systematic reviews, regional reviews (Arab world, Sub-Saharan Africa and Latin America and the Caribbean), as well as Armenia, Kosovo, Indonesia, Rwanda, Sri Lanka, China, Brazil, South Africa, Morocco, Mongolia, and Senegal. Tying evidence statements to specific countries was done when possible, but it was not possible in every case. In global and regional studies, data collection/collation is more dispersed, and insights less concrete.



\ ABOUT THE RAPID EVIDENCE REVIEWS

What are Rapid Evidence Reviews?

Rapid Evidence Reviews (RERs) are concise syntheses of available evidence. They are commissioned by the Swiss State Secretariat for Economic Affairs' (SECO) Economic Cooperation and Development division. Each RER provides a structured and rigorous overview of available evidence on a topic relevant to SECO Economic Cooperation and Development's portfolio, more systematic than a traditional literature review, yet more resource-efficient than a full systematic review. Inspired by international good practice in rapid evidence synthesis, RERs are designed to bridge the gap between research and operational practice.

Purpose and Use

RERs are produced on demand for SECO Economic Cooperation and Development's operational units to address concrete evidence needs arising from programming decisions. They are designed to be actionable and timely, integrating evidence into real-time decision-making rather than focusing solely on retrospective experience and reporting. RERs synthesise evidence from academic literature, grey literature such as publications by multilateral organisations, and evaluation reports. They draw on research portals' resources, as well as established databases such as the 3ie Development Evidence Portal and DEval's Rigorous Evidence Database, as well as SECO's own evaluation knowledge. The service was piloted in 2025 and intends to produce up to four reviews per year.

Production and Quality Assurance

RERs are produced within the framework of the GOPA/CEval's backstopping mandate (2025-2028) on behalf of SECO Economic Cooperation and Development's Quality and Resource section (SECO-WEQA). Research questions are co-constructed by SECO operational units, WEQA, and the backstopping team. The evidence search strategy and inclusion criteria are developed by the backstopping team and coordinated with SECO-WEQA. Each review undergoes internal quality assurance and is reviewed by WEQA staff prior to publication. Reviews are produced by the backstopping team, typically requiring approximately 12 – 15 working days from the point at which the research question has been defined to finalisation. The backstopping team bears full responsibility for the accuracy and correctness of the reviews.

The RER Series

This document is part of an ongoing series of Rapid Evidence Reviews covering topics across SECO's eight business lines, including economic policy, trade, infrastructure, private sector development, and skills. Published RERs are made available through ARAMIS, the research database of the Swiss Federal Administration.

For further information on the RER service, please contact we.evaluation@seco.admin.ch.