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Modeling Tomorrow: Innovation for Sustainable Development Innovation Systems, Technological Capabilities, and Sustainability Transitions in Latin America and the Caribbean



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Modeling Tomorrow: Innovation for Sustainable Development

Innovation Systems, Technological Capabilities, and Sustainability Transitions in Latin America and the Caribbean

CHAPTER II.

II. Building Innovation Capabilities in Small and Open Economies

Internationally Embedded Innovation Systems in Caribbean SIDS: Converting External Knowledge into Local Technological Capability

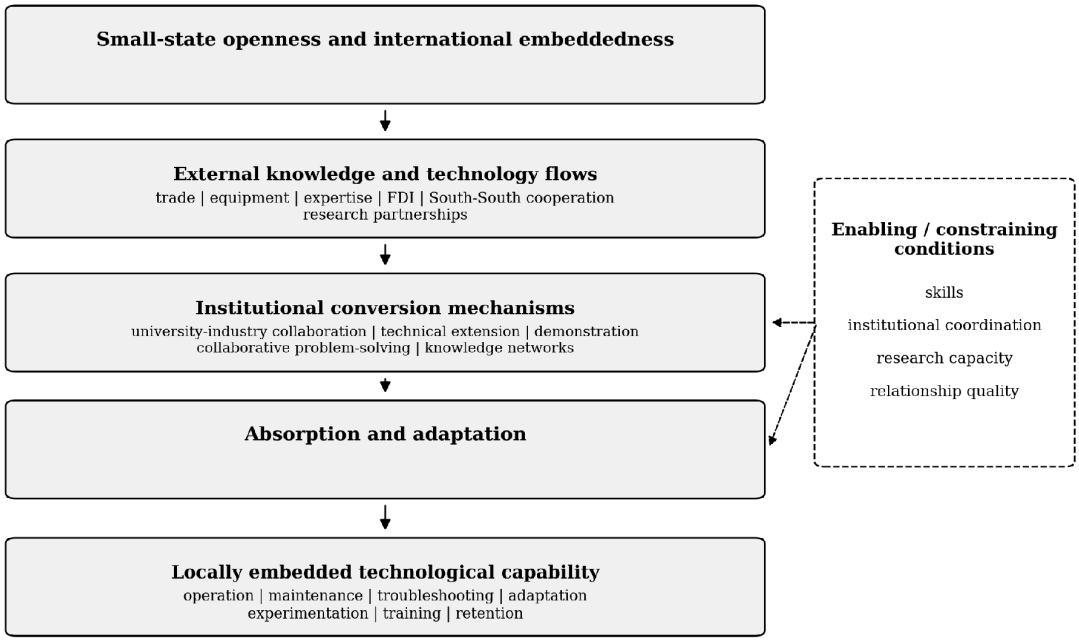
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1. Introduction

Caribbean small island developing states (SIDS) are structurally open economies whose small size, narrow production bases, and exposure to external shocks have long been treated as sources of vulnerability (Briguglio, 2014; Briguglio et al., 2009). This openness extends to knowledge and technology: Caribbean firms and public institutions rely heavily on imported equipment, foreign expertise, and externally financed research (ECLAC, 2011, 2012). At the same time, the region's science, technology and innovation (STI) landscape is widely described as fragmented, with numerous regional bodies but limited policy integration and weak coordination between universities, firms, and public agencies (ECLAC, 2026).

These two conditions - external reliance and domestic fragmentation - are usually discussed separately: the first as an economic-geography problem, the second as an institutional one. This paper treats them as connected. Caribbean SIDS are not simply innovation systems that happen to import more than they should; their small scale makes international knowledge and technology flows a structural feature of their innovation systems rather than an occasional supplement to them. The developmental question this raises is not whether Caribbean economies should reduce external reliance - for most SIDS this is not a realistic policy goal - but whether the institutional relationships surrounding that reliance allow externally sourced knowledge to be absorbed, adapted, and retained locally, rather than simply accessed and used. The existing literature establishes that access does not straightforwardly translate into capability. Innovation in Caribbean manufacturing firms is associated with size, export orientation, and the use of imported capital goods, while the relationship with foreign ownership itself is mixed rather than uniformly absent (Mohan et al., 2016, 2017a), as Section 2 details. Skills constraints are repeatedly identified as a binding bottleneck (Khadan, 2018; Rosenblatt et al., 2024). What remains underspecified is the institutional mechanism: how, if at all, imported knowledge and technology are converted into capability that persists locally rather than depending on continued external involvement. This paper addresses that gap through the following research question: through what institutional mechanisms do internationally embedded innovation systems in Caribbean SIDS convert externally sourced knowledge into locally embedded technological capability? It develops and critically evaluates the internationally embedded innovation systems lens - a conceptual synthesis proposed here, not an established term in the literature - as an alternative to viewing Caribbean SIDS as bounded national systems judged against a self-sufficiency benchmark they were never structurally positioned to meet. Figure 1 summarises this proposed knowledge-conversion process and the enabling and constraining conditions examined in the analysis.

Figure 1. Internationally embedded innovation system and knowledge-conversion process



Source: Author's synthesis based on Cohen and Levinthal (1990), Adeoti (2002), Denner (2012), Pereira and Steenge (2022), and Cirera and Maloney (2017).

The paper proceeds as follows. Section 2 reviews the literature on Caribbean innovation dependence, absorptive capacity, and external knowledge relationships. Section 3 outlines the integrative documentary method. Section 4 develops four propositions culminating in the internationally embedded innovation systems concept. Section 5 sets out next steps for doctoral fieldwork.

2. Literature Review

2.1 Caribbean innovation systems and international knowledge dependence

Caribbean STI institutions are characterised in the regional literature as numerous but poorly integrated. ECLAC (2026) identifies a lack of policy integration and continued reliance of national research systems on external funding as persistent features of the regional ecosystem, consistent with earlier ECLAC assessments describing a historical emphasis on importing equipment and technology over developing indigenous research capacity (ECLAC, 2011, 2012). The persistence of this characterisation across roughly a decade and a half of ECLAC reporting suggests a structural condition rather than a transitional phase. Firm-level evidence from the IDB's Caribbean innovation surveys reinforces this picture from a different angle, though the foreign-ownership findings are more mixed than a single summary figure suggests. Mohan et al. (2016) find that foreign ownership does not significantly predict a Caribbean firm's decision to invest in innovation, although it does positively predict technological innovation at a later stage of their sequential model. Mohan et al. (2017a), analysing FDI specifically, find the opposite sign on a related measure: foreign ownership reduced the probability of product or process innovation, while foreign inputs - distinct from foreign ownership - increased it, and horizontal

FDI spillovers to domestic firms were not statistically significant. These findings do not converge on a single clean relationship between foreign ownership and innovation; what they consistently support is a narrower point, developed further in Section 4, that the presence of an international ownership or supply channel does not by itself demonstrate that locally retained technological capability has resulted. This also cautions against a common policy assumption - that attracting FDI will, by itself, seed domestic innovation capacity - since the regional data do not support that inference. Human capital constraints compound the picture. Khadan (2018) and Rosenblatt et al. (2024) both identify skills deficiencies as a principal barrier facing potential innovators, with the latter noting particularly low rates of digital innovation adoption. University- industry interaction, which might otherwise compensate for firm-level skills gaps, has had limited and largely project-based success historically; King and Cameron (2013) document a specific model in Trinidad and Tobago's energy sector, built around the country's Metal Manufacturing and Engineering Research Centre, but this remains an isolated rather than systemic example. Taken together, these strands describe a regional system in which external inputs are structurally necessary, formal domestic coordinating mechanisms exist but are thin, and the skills base needed to convert either into sustained innovative activity is itself constrained.

2.2 Absorptive capacity and technological capability

The theoretical vocabulary for interpreting this pattern comes from absorptive capacity theory, which describes an organisation's capacity to recognise the value of external knowledge, assimilate it, and apply it to commercial or productive ends (Cohen & Levinthal, 1990). Absorptive capacity supplies a plausible conceptual bridge between access to external knowledge and its application, a bridge the mixed Caribbean firm-level findings above are consistent with, though those findings do not by themselves establish which firms possess or lack absorptive capacity. A related distinction concerns technological capability: the difference between using an imported technology and possessing the locally retained capacity to operate, troubleshoot, maintain, adapt, and eventually redevelop it (Adeoti, 2002). Cirera and Maloney (2017) formalise a related idea as an "innovation paradox," in which developing-country firms under-invest in the capabilities needed to climb a technological "capabilities escalator" even where formal incentives to innovate exist - a lens applied further in Section 4.

2.3 External knowledge relationships and the conversion problem

A third strand addresses how external relationships themselves shape - or fail to shape - this conversion. Pereira and Steenge (2022) argue that connectivity to metropolitan and international partners is a meaningful resilience factor for small island states, but note that the same connectivity implies dependency, since the state's fortunes become tied to shocks originating elsewhere. Denner (2012) similarly frames knowledge networks as a deliberate institutional tool through which Caribbean SIDS might convert external linkages into developmental capacity, though the framing is more prescriptive than empirically demonstrated within the region. South-South cooperation (SSC) offers a further, more mixed body of evidence, and one particularly relevant to the mechanism question this paper poses. UNCTAD (2012) cautions that access to knowledge through SSC arrangements can remain "access to information" where recipient actors lack the capacity to build upon it - echoing the absorptive capacity problem above and reinforcing that SSC is not, by virtue of shared developing-country status, automatically more conducive to capability transfer than North-South arrangements. Graber and Rault-Chodankar's (2026) study of an Indo-Cuban biopharmaceutical collaboration documents a case in which SSC generated real capability and learning over a sustained period, but also

encountered structural tensions and eventual institutional breakdown attributed to divergent value regimes between partners - instructive precisely because it does not resolve cleanly in either direction. Lin and Cui (2024) find that Chinese agricultural technology demonstration centres in Africa improved food-security outcomes through structured, hands-on demonstration, using a rigorous triple-difference-in-differences design - one of the few SSC mechanisms in the corpus with a defensible empirical evaluation attached. However, the evidence is African, not Caribbean, and concerns a different commodity and institutional context; its transferability to small-island settings should be treated as inferred rather than established, and this paper does not claim otherwise. Taken together, this literature identifies that conversion from external knowledge to local capability is uneven, but stops short of specifying the institutional mechanisms through which conversion is supposed to occur in a Caribbean SIDS setting. That is the gap this paper addresses.

3. Methodology

This paper is framed as a focused integrative literature review and theory-building documentary analysis, rather than a systematic review, since no formal systematic-review protocol was applied. A purposively constructed corpus of 25 sources was assembled across five bodies of literature: Caribbean innovation systems and STI institutions; Caribbean firm-level innovation and capability; small-state vulnerability and resilience; absorptive capacity, technological capability, and innovation-systems theory; and international and South-South technology and knowledge cooperation. Sources within each body were located through targeted searches and citation tracing from key texts, with selection prioritising Caribbean empirical studies, authoritative regional policy evidence (principally ECLAC and IDB publications), foundational absorptive-capacity and technological-capability theory, and comparator South-South technology-transfer studies capable of speaking to the mechanism question where Caribbean-specific evidence is absent. Sources were classified by the type of evidentiary support they offer: direct empirical findings (results from primary Caribbean data, such as the IDB firm surveys); cross-source synthesis (claims built by combining separate sources, such as the internationally embedded innovation systems lens itself); theoretical inference (claims drawn from theory rather than regional data); and relationships that remain untested within the corpus (such as the applicability of African SSC demonstration-centre evidence to Caribbean agriculture). This classification allows the analysis in Section 4 to distinguish, proposition by proposition, between claims resting on Caribbean data and claims extending comparator or theoretical evidence, a distinction preserved throughout rather than collapsed for narrative convenience. Three limitations should be acknowledged. First, the corpus's strongest quantitative evidence - the IDB Caribbean firm-innovation surveys underpinning Dohnert et al. (2017), Mohan et al. (2016, 2017a, 2017b), and Khadan (2018) - derives substantially from data collected around 2014. Second, this evidence is manufacturing-heavy despite services' dominance of most Caribbean economies. Third, evidence specific to smaller OECS states is thinner than for larger territories such as Trinidad and Tobago, and no longitudinal evidence in the corpus traces capability retention over time within a single Caribbean case. These limitations shape the conditional, proposition-based structure of the analysis that follows.

4. Analysis of Results

Proposition 1: Access is not capability.

The clearest pattern in the Caribbean evidence base is that external connectivity and imported technology create technological opportunity without themselves demonstrating that locally embedded capability has resulted. The foreign-ownership evidence illustrates this precisely because it does not resolve into a single tidy finding. Mohan et al. (2016) find that foreign ownership does not significantly predict a firm's decision to invest in innovation, though it positively predicts technological innovation once that investment stage is reached. Mohan et al. (2017a), examining FDI specifically, find that foreign ownership reduced the probability of product or process innovation, that foreign inputs increased it, and that horizontal spillovers to domestic firms were not statistically significant. These results are mixed rather than uniform, and are consistent with - without directly establishing - an absorptive-capacity explanation, in which the presence of an international channel does not by itself guarantee the organisational capacity to recognise, assimilate, and apply what that channel makes available (Cohen & Levinthal, 1990); the surveys do not measure absorptive capacity itself. What the findings do support, more narrowly, is that international ownership or supply access is not a reliable proxy for locally retained technological capability, whatever the underlying mechanism. Training data reinforce this caution. In-firm training's estimated effect on innovation probability is negligible or statistically insignificant in several Caribbean models (Khadan, 2018; Mohan et al., 2017b), indicating that even direct, purpose-built skills interventions do not reliably translate into innovation outcomes. None of these forms of access is sufficient on its own to demonstrate locally embedded capability, and treating any one of them as a proxy for capability risks overstating how much conversion has actually occurred.

Proposition 2: Fragmented institutional linkages constrain conversion.

Where Proposition 1 addresses firm-level access, Proposition 2 addresses the surrounding institutional architecture, drawing on evidence specific to Caribbean STI systems rather than inferring institutional thinness from firm-level absorptive-capacity theory. ECLAC (2026) characterises the regional STI ecosystem as lacking policy integration, with national research systems remaining heavily dependent on external funding rather than embedded in dense domestic linkages between universities, public agencies, and productive sectors. This regional-system evidence, rather than theoretical extrapolation from the firm level, is the basis for treating institutional thinness as a documented feature of the Caribbean case. University-industry interaction, one of the few mechanisms with documented Caribbean evidence, has produced identifiable models - such as the collaboration structure documented in Trinidad and Tobago's energy sector, built around a dedicated research and engineering centre (King & Cameron, 2013) - but these appear as isolated instances rather than a systemic feature, and the broader literature describes such relationships as often weak or project-based. Skills constraints (Khadan, 2018; Rosenblatt et al., 2024) compound this fragmentation: firms and public agencies that might wish to absorb external knowledge may lack the internal technical capacity to do so, and the intermediary institutions - brokers, extension services, sustained university partnerships - that a less fragmented system might supply to compensate are themselves reported as thin regionally. The result, on this Caribbean-specific evidence, is that the institutional linkages through which absorption might be actively cultivated and diffused beyond a single project are structurally underdeveloped, which helps explain why isolated successes such as the Trinidad and Tobago model have not generalised.

Proposition 3: Conversion depends on interaction and adaptation, not passive transfer.

If access and fragmented linkages jointly explain why conversion is incomplete, the literature also offers partial evidence on what conversion looks like when it does occur. The recurring theme across the strongest available cases is that successful mechanisms are interactive, relational, and context-dependent rather than a one-directional handover of equipment or instructions. Cesarino's (2013) dissertation-based study of Brazil-Africa South-South cooperation in agriculture offers the corpus's most direct evidence on this point: capacity-building and technology adaptation are documented as processes of "context-making," in which recipient and provider actors jointly co-produce a version of the technology fitted to local conditions, rather than the recipient simply receiving a fixed package. Cesarino also documents organisational fragility and open questions about project robustness and continuity in these arrangements, with outcomes uneven across cases. This adds a relational dimension the mechanism question needs: conversion appears to depend not only on which mechanism (extension, demonstration, collaboration) is used, but on how robustly the relationship sustaining it is maintained over time. Rogers's (2016) functional analysis of the Barbados solar water heater industry documents a comparable pattern within the Caribbean itself: early development succeeded through policy-driven incentives alongside functioning technical-assistance and extension relationships. However, the same case later entered market stagnation as stakeholder-network functions weakened - a caution, consistent with Cesarino's fragility finding, that conversion mechanisms require ongoing institutional maintenance rather than a one-time intervention. Lin and Cui's (2024) evidence on Chinese demonstration centres in Africa is retained here only as further, qualified, comparator evidence for structured demonstration as a mechanism, given the African-not-Caribbean caveat discussed in Section 2.3. Graber and Rault-Chodankar's (2026) Indo-Cuban case adds a sobering qualification of its own: even a genuinely interactive SSC relationship that produces real, sustained learning is not self-sustaining once value-regime tensions cause the underlying institutional relationship to dissolve. Read together, these cases suggest that candidate conversion mechanisms available to the region - technical extension, demonstration, collaborative problem-solving, knowledge networks (Denner, 2012) - are plausible but precarious. They can support learning, adaptation, and capability formation under the right institutional conditions, but durable local retention remains insufficiently demonstrated across the corpus; none of the cases supports treating such mechanisms as self-sustaining once established, and each requires continued relational maintenance to avoid the stagnation, fragility, or dissolution observed in Barbados, in the Brazil-Africa cases, and in the Indo-Cuban case respectively.

Proposition 4: International embeddedness is both an opportunity and a vulnerability.

The preceding propositions point toward a reframing rather than a resolution. Pereira and Steenge (2022) show that connectivity to external partners is a meaningful resilience factor for small island states, while simultaneously tying those states to shocks originating in partner economies. This dual character extends beyond economic resilience to knowledge relationships specifically: the same international linkages that expose Caribbean SIDS to imported equipment, foreign expertise, and SSC partnerships also expose them, as the Indo-Cuban case shows, to institutional tensions that no single participating actor fully controls. Given the region's small scale, structural openness is a persistent structural condition that cannot realistically be eliminated; the policy-relevant question is therefore not how to achieve technological self-sufficiency, but how domestic institutions can retain agency, learning, and problem-solving capacity within international relationships that will, by structural necessity, continue. This is the

basis for proposing an internationally embedded innovation systems lens: a way of viewing Caribbean SIDS innovation systems in which international knowledge and technology flows are treated not as an external supplement to an otherwise bounded domestic system, but as a structural component of the system itself. This framing synthesises connectivity theory's resilience- dependency duality (Pereira & Steenge, 2022), Cirera and Maloney's (2017) capabilities-escalator account of international technology diffusion, and Denner's (2012) knowledge-networks framework; it is not a term used elsewhere in the reviewed literature and is advanced here as this paper's conceptual contribution. Under this framing, "external reliance" ceases to be read as system failure and becomes instead the starting condition against which institutional capacity for absorption, adaptation, and retention must be assessed. This reframing has an implication for how the four propositions above should be read together, rather than separately. Proposition 1 shows that access does not equal capability; Proposition 2 identifies, from Caribbean institutional evidence specifically, part of why - fragmented domestic linkages constrain absorption; Proposition 3 identifies candidate mechanisms through which absorption can nonetheless occur, while showing that each is precarious rather than self-sustaining; and Proposition 4 argues that the openness underlying all three is not itself the problem to be solved. The four propositions therefore point toward a single underlying claim: capability formation in Caribbean SIDS depends not on openness alone, but on the institutional arrangements built within it. This is a modest but analytically useful reorientation. It shifts the evaluative question away from how dependent a Caribbean innovation system is, and toward how well-designed its international relationships are for retaining learning, agency, and problem-solving capacity locally.

5. Next Steps

This proceedings article develops the internationally embedded innovation systems concept theoretically, from a documentary corpus rather than original fieldwork; no interviews or primary empirical data have been collected for this stage of the research. The doctoral research programme from which this paper is drawn will test the proposition empirically through purposively selected sectoral case studies within Caribbean SIDS, combining semi-structured interviews with firm, university, and public-agency actors, documentary evidence on specific technology partnerships, and, where feasible, longitudinal or process-tracing methods that follow a partnership's development over time rather than capturing a single cross-sectional snapshot. Fieldwork will need to move beyond the presence of a conversion mechanism - a training programme, a demonstration project, a university-industry agreement - to observable indicators of whether locally embedded capability actually results. Candidate indicators, informed by the technological capability literature (Adeoti, 2002), include: independent operation of the technology without ongoing external supervision; local capacity for maintenance and troubleshooting; adaptation of imported technology to local conditions; local experimentation beyond the technology's original design parameters; local technical problem-solving in response to failures or changing requirements; the capacity of local actors to train others; and, most stringently, whether locally retained knowledge and functioning persist after external partners withdraw. None of these indicators has been empirically observed within the present study; they are proposed here as the analytical targets for the empirical phase of the research.

6. References

Adeoti, J. O. (2002). Building technological capability in the less developed countries: The role of a national system of innovation. *Science and Public Policy, 29*(2), 95-104.

Briguglio, L. (2014). A vulnerability and resilience framework for small states. In D. Bynoe-Lewis (Ed.), *Building the resilience of small states: A revised framework* (pp. 1-102). Commonwealth Secretariat.

Briguglio, L., Cordina, G., Farrugia, N., & Vella, S. (2009). Economic vulnerability and resilience: Concepts and measurements. *Oxford Development Studies, 37*(3), 229-247.

Cesarino, L. (2013). *South-South cooperation across the Atlantic: Emerging interfaces in international development and technology transfer in agriculture* [Doctoral dissertation, University of California, Berkeley].

Cirera, X., & Maloney, W. F. (2017). *The innovation paradox: Developing-country capabilities and the unrealized promise of technological catch-up*. World Bank.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128-152.

Denner, K. (2012). *Employing knowledge networks as tools for the development of Caribbean small island developing states*. ECLAC.

Dohnert, S., Crespi, G., & Maffioli, A. (Eds.). (2017). *Exploring firm-level innovation and productivity in developing countries: The perspective of Caribbean small states*. Inter-American Development Bank. https://doi.org/10.18235/0000616

ECLAC. (2011). *Study on the vulnerability and resilience of Caribbean SIDS*. Economic Commission for Latin America and the Caribbean.

ECLAC. (2012). *Development paths in the Caribbean*. Economic Commission for Latin America and the Caribbean.

ECLAC. (2026). *Repositioning science, technology and innovation for sustainable development in Caribbean SIDS* (LC/CAR/2026/1). Economic Commission for Latin America and the Caribbean.

Graber, N., & Rault-Chodankar, Y.-M. (2026). Between technology transfer and South-South collaboration: An Indo-Cuban experiment in biopharmaceutical innovation. *BioSocieties, 21*, 158-183.

Khadan, J. (2018). *Estimating the effects of human capital constraints on innovation in the Caribbean*. Inter-American Development Bank.

King, G. S., & Cameron, C. R. (2013). An enhanced model for university-industry collaboration for innovation in Trinidad and Tobago. *West Indian Journal of Engineering, 36*(1), 86-94.

Lin, S., & Cui, J. (2024). South-South cooperation and food security: Evidence from Chinese agricultural technology demonstration centre in Africa. *China Economic Quarterly International, 4*(1), 1-12.

Mohan, P., Watson, P., & Strobl, E. (2016). Innovative activity in the Caribbean: Drivers, benefits and obstacles. In M. Grazzi & C. Pietrobelli (Eds.), *Firm innovation and productivity in Latin America and the Caribbean* (pp. 73-101). Palgrave Macmillan.

Mohan, P., Strobl, E., & Watson, P. (2017a). Foreign direct investment and innovation and productivity in the Caribbean. In S. Dohnert, G. Crespi, & A. Maffioli (Eds.), *Exploring firm-level innovation and productivity in developing countries: The perspective of Caribbean small states* (pp. 63-84). Inter-American Development Bank.

Mohan, P., Strobl, E., & Watson, P. (2017b). *In-firm training, innovation and productivity: The case of Caribbean SIDS* (IDB Working Paper Series No. IDB-WP-778). Inter-American Development Bank.

Pereira, E. E., & Steenge, A. E. (2022). Vulnerability and resilience in the Caribbean island states: The role of connectivity. *Networks and Spatial Economics, 22*, 515-540.

Rogers, T. (2016). Development of innovation systems for small island states: A functional analysis of the Barbados solar water heater industry. *Energy for Sustainable Development, 31*, 143-151.

Rosenblatt, D., Beuermann, D., Dohnert, S., Clayton, K., Saboin, J. L., Mazzocca, A., Ortiz de Mendívil, C., Gauto, V., Hussain, L., & Castilleja Vargas, L. (2024). *Caribbean Economics Quarterly: Volume 13, Issue 3: Innovation for faster economic growth in the Caribbean: Are we there yet?* Inter-American Development Bank. https://doi.org/10.18235/0013347

UNCTAD. (2012). *Technology and innovation report 2012: Innovation, technology and South-South collaboration*. United Nations.