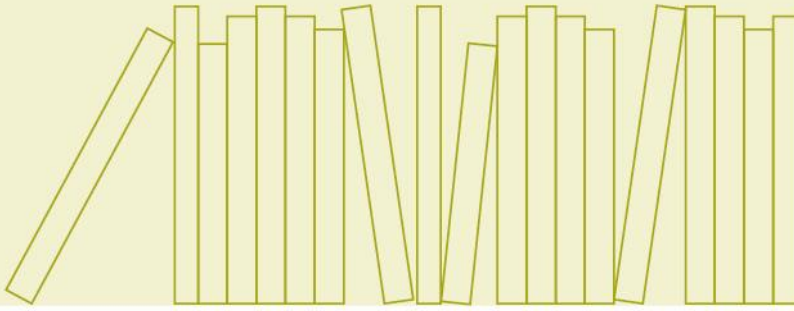
Economic Commission for Latin America and the Caribbean

ECLAC SUBREGIONAL HEADQUARTERS FOR THE CARIBBEAN

Report of the expert group meeting to review a study on science, technology and innovation for sustainable development: lessons from the Caribbean's energy transition



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Economic Commission for Latin America and the Caribbean
Subregional Headquarters for the Caribbean

Expert group meeting to review a study on science, technology and innovation for sustainable development: lessons from the Caribbean's energy transition

Virtual meeting, 19 October 2022

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REPORT OF THE EXPERT GROUP MEETING TO REVIEW A STUDY ON SCIENCE, TECHNOLOGY AND INNOVATION FOR SUSTAINABLE DEVELOPMENT: LESSONS FROM THE CARIBBEAN'S ENERGY TRANSITION

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CONTENTS

A. ATTENDANCE AND ORGANIZATION OF WORK

1. Place and date

1. The Economic Commission for Latin American and the Caribbean (ECLAC) convened an expert group meeting to review a study titled "Science, technology and innovation for sustainable development: lessons from the Caribbean's energy transition". The meeting took place virtually by Webex, on 19 October 2022.

2. Attendance

2. There were 15 persons in attendance and included representation from the following stakeholder groups: governments; private sector; regional experts; and academia. Written comments on the study were also received from the experts listed in annex I.

3. Meeting agenda

1. Online registration
2. Agenda item 1: Opening of meeting
3. Agenda item 2: Presentation of report "Science, technology and innovation for sustainable development: lessons from the Caribbean's energy transition"
4. Agenda item 3: Discussion and comments from experts
5. Agenda item 4: Summary and way forward
6. Agenda item 5: Closing remarks
6. Closing of the meeting

B. REPORTING THE PROCEEDINGS

1. Opening of the meeting

3. The Deputy Director of the Economic Commission for Latin America and the Caribbea (ECLAC) subregional headquarters for the Caribbean welcomed participants to the expert group meeting, convened virtually, to discuss the draft study titled "Science, technology and innovation for sustainable development: lessons from the Caribbean's energy transition". He noted that the study sought to assess the importance of science, technology, and innovation (STI) towards achieving sustainable development by assessing whether the advancement of STI in the subregion was driving the energy transition in the Caribbean. He noted that by identifying lessons and best practices from the energy transition with a focus on the electricity sector, the study sought to indicate how advancement of STI could take place through the development and implementation of legislation, policies, and partnerships supportive of innovation. The Deputy Director brought his remarks to a close by inviting the experts to offer frank feedback on the research findings and proposed recommendations.

2. Presentation of the report "Science, technology and innovation for sustainable development: lessons from the Caribbean's energy transition"

4. An overview of the draft study was presented by the Associate Environmental Affairs Officer and the Sustainable Development Officer, both part of the Sustainable Development and Disaster Unit within ECLAC subregional headquarters for the Caribbean.

5. The Sustainable Development Officer outlined the purpose of the study, which was to assess whether STI was recognized as contributing towards achieving sustainable development within the Caribbean subregion. She noted that by focusing on the energy transition, and more specifically the electricity sector, the study sought to identify whether the energy transition was being driven through the use and availability of STI.

6. The methodology used to guide the research consisted of desk top reviews of the literature and open-ended interviews. The Sustainable Development Officer noted that 30 experts in the fields of energy and STI were interviewed. The interviewees ranged from different sectors including: the public and private sectors, academia, and intergovernmental organizations. Interviewees ranged from seven Caribbean countries: Barbados, Belize, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, and Turks and Caicos Islands. Two countries - Barbados and Jamaica - were selected to explore how common elements identified in the research are addressed in country-specific circumstances.

7. An overview of the STI institutional framework within Caribbean countries was presented. Data obtained as part of the research showed a decline in the number of ministries specifically referencing STI in the name in 2022, when compared to similar data from 2015. Only five of the countries assessed had specialized STI agencies and only three countries had formally approved national STI policies. Data from the study showed that research and development (R&D) continued to be underfunded within the subregion, however there were some examples of greater investment in some countries. Regionally, it was acknowledged that organisations such as the Caribbean Diaspora for Science, Technology and Innovation (CADSTI) could assist with promoting and funding R&D within the subregion.

8. The Associate Environmental Affairs Officer presented the second part of the study that assessed whether the advancement of STI was driving the energy transition in the subregion. The study found that three key elements were instead advancing the increasing use of renewables in Caribbean SIDS:

(i) Dependence on high-cost imported fossil fuels subject to volatile international prices.
(ii) Decreasing international costs of renewable energy generation technologies.
(iii) Commitment to international agreements targeting greenhouse gas emissions reduction.

9. Concerns over climate resilience were also frequently mentioned in the research as an essential element influencing the planning of grid modernization and expansion because of the increasing vulnerability of countries' energy infrastructure due to more frequent extreme weather events.

10. The study also analysed three key elements that should be considered in raising the profile of STI in the Caribbean subregion in support of the energy transition:

(i) Regulatory and institutional frameworks reshaping the electricity market structure in the subregion, incentivized new players, contributing to the adoption of renewables, and potentially leveraging technology innovation.
(ii) Human capital formation promoted by educational institutions and private companies could support the energy transition and create new jobs and income.
(iii) Research and development, albeit underfunded, has the potential to support efforts to tackle climate vulnerabilities of the subregion's electricity system through technology adaptation.

11. The Associate and Environmental Affairs Officer presented the findings on how common elements identified in the research are addressed in two countries – Barbados and Jamaica.

12. The Barbados National Energy Policy 2019–2030 introduced the target of having an electricity matrix sourced by 100 per cent of renewables by 2030 - mainly solar photovoltaics (PV) and wind power - moving from a matrix where renewables represented only 16 per cent in 2021. The Barbados Light and Power Company, the country's utility company, was found to work in conditions that were close to monopolistic. Nonetheless, regulatory and legislative changes that had taken place in previous years favoured the unbundling of the electricity sector. A new licensing scheme seeking to further incentivize more players into the market was under negotiation. Regarding human capital formation, Barbados' tertiary education institutions were perceived to be more advanced in their curricula reform to promote technology and innovation. This assessment was particularly the case for vocational and professional training institutions. However, the country still had considerable skills and occupational gaps that hindered the pace of the energy transition. The research found that there were insufficient courses and training opportunities being offered in relation to wind technology, which was expected to supply almost half of Barbados' electricity by 2030. The research also found that there was significant political awareness and will to promote R&D in the sector, with fiscal incentives being a relevant policy mechanism. Nonetheless, there were barriers to promote and fund R&D by private sector entities, such as the scale of most small and medium-sized enterprises and the risk-averseness of traditional financial institutions.

13. Jamaica was the second case study presented. The country's integrated resource plan set a scenario for 2037 where renewables would source 49 per cent of the country's electricity matrix, and natural gas would replace oil as the primary electricity source. Similarly, to the previous case study, regulatory and legislative changes in Jamaica had also favoured the unbundling of the electricity sector. Nonetheless, new tenders seeking to install additional capacity were not taking place due to the ongoing structuring of the Generation Procurement Entity. Large consumers were going off-grid due to the high energy cost and the general disaffection with service provided by the country's utility. Regarding human capital formation, the research identified that an issue for Jamaican educational institutions was the low number of lecturers on science, technology, engineering, and mathematics (STEM) subjects, a limitation often tackled through international collaboration. Private sector institutions often supported training in renewable energy technologies, filling critical skills and occupation gaps. On the topic of R&D, the country was seeing an increasing interest in several innovative technologies related to renewable energy. Still, the nexus between renewables and research and development in the country's energy policy was unclear. Finally, the study identified the Caribbean Sustainable Energy and Innovation Institute (CSEII) as a good example of how educational institutions can promote better connections between researchers and market needs.

14. The Sustainable Development Officer outlined the research conclusions which noted that although STI was perceived as being important to sustainable development, it was not understood to be a priority for many countries in the Caribbean subregion.

15. The Sustainable Development Officer then outlined the six recommendations emanating from the research:

(i) Support initiatives that promote an STI culture in the subregion
(ii) Mainstream STI at all levels of education
(iii) Create an enabling institutional environment
(iv) Increase STI funding
(v) Promote partnerships
(vi) Develop monitoring and evaluation frameworks

16. In closing, the Associate Environmental Affairs Officer proposed the following five discussion points based on the written review and comments received on the study by the experts:

(i) Were patents filed by Caribbean nationals in international patent offices an appropriate indicator to assess and monitor R&D in the subregion? What did that indicator say about Caribbean STI?
(ii) What had been Caribbean success STI stories in the past 20 years and what lessons could be drawn from them? What could be learnt from unsuccessful experiences in the same period?
(iii) What role did frontier technologies and technology transfer and adaptation play in supporting the energy transition and the advancement of STI in the Caribbean?
(iv) Acknowledging that non-governmental stakeholders needed to be centre stage in STI development, what was/were the role(s) of governments in promoting STI in the Caribbean?
(v) How could resources for R&D be increased in the Caribbean and what coordination and partnership mechanisms could engage different institutions to support such an effort?

3. Discussion

17. The Sustainable Development Officer then invited the participating experts to provide their views on the proposed discussions points as well as outline any general thoughts on the study findings.

18. The Managing Director of Soloricon Limited commended the authors for the work on the topic of STI. He noted that the concept of STI was typically a difficult one to understand, particularly among public officials. He went on to note the importance of having an STI champion at the level of Cabinet. The Managing Director indicated that there was a need for more efforts to be made in order to demystify STI among stakeholders. Using the example of traditional farming practices, he further suggested that in the context of the Caribbean, STI needed to be linked to traditional/indigenous knowledge. He outlined a few recommendations which included the setting up of a government portal to address challenges faced in patent registration. He also recommended that further engagement of the private sector was required through the organization of science fairs and hackathons. Lastly, he noted that there was a more pivotal role for the media in the promotion of STI in the Caribbean.

19. The Managing Director of KMA Consulting Limited noted that the application of STI should be viewed as a way of life, required for the subregion's continuous development. Generally, technological innovations were more geared towards increasing efficiency of an existing business. She noted that there was an absence of a culture focused on the production of quality products, which could be due to an absence of data required for measuring the performance of products. She went on to express concern that many STI departments were still attached to ministries of education, noting that STI agencies could potentially obtain higher regard if linked to ministries of trade or economic development. She expressed caution of utilizing patents as an indicator of STI advancement, noting that the Caribbean subregion was not in the business of selling ideas and, as such, innovators are less likely to register patents.

20. The Council Member of the Caribbean Academy of Science expressed that he was in support of many of the points raised by the previous experts. Specifically on the issue of patents, he noted that the issue of registering patents was a distraction for the small economies of the Caribbean, and that the subregion should instead be focusing on measuring the application of innovations in local industries and the society. He further argued for the decoupling of science, technology, and innovation since each one was a distinct entity with its own development implications. He went on to observe that pure science was important in the development of technology, which in turn led to the development of inventions. Innovation on the other hand, could occur at any time and place, and was dependent on the outlook and vision of the innovators, and linked to economic and social development. The Council Member of the Caribbean Academy of Science noted that whilst innovations within businesses in the subregion could be impactful, greater impact could come from utilizing global knowledge systems to identify successes and applying

those to the subregion's development needs. Finally, he surmised that the Caribbean had a rich history of innovation in the past, but its capacity had declined significantly over time.

21. In responding to these comments, the Sustainable Development Officer inquired of participants as to why they felt that the subregion's innovative capacity had declined over time. The Council Member of the Caribbean Academy of Science suggested that this was due to the declining priority placed on Caribbean R&D institutions, which had moved away from pure and applied research to providing services.

22. The Associate Vice-President, Sustainable Energy, University of Technology, Jamaica, congratulated the authors on tackling this topic, which whilst important, also proved to be difficult in obtaining the necessary data and information. She then weighed in on the issue of patents by reporting that the Intellectual Property Office in Jamaica had made significant progress in the registration of patents of local innovators. She however pointed to the challenge of registering such patents internationally, noting that while this would provide more lucrative and favourable commercialization opportunities, it was a very expensive process, which often worked against local stakeholders. The Associate Vice-President, Sustainable Energy also suggested that good communication was critical for promoting STI, and that since the subregion was not doing well in this area, this was a disincentive for the private sector to engage. Moving forward, she noted that it would be important that the subregion identified priority problems which needed to be solved and invested in the R&D necessary to address them. She further noted that the subregion should develop the necessary STI infrastructure to allow for its commercialization. Other recommendations outlined included the strengthening of existing institutional networks such as the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE); the enhancement of R&D, especially in the application of frontier energy technologies; and the clarification of procedures for providing public funding to support R&D in the subregion. In the case of the latter, she observed that public funds were often allocated for R&D in national budgets, but research institutions typically struggled to access such funds since the avenues for doing so were often not clear to stakeholders.

23. The Economic Affairs Officer, ECLAC subregional headquarters for the Caribbean, addressed the issue of the limited fiscal and institutional resources within governments in small States, such as those in the Caribbean. Taking this into account, he noted that small States should focus on strengthening their STI policy to solve local problems and address national challenges. He further pointed to the issue of economies of scale, which was a challenge for these small States, and suggested a regionally integrated approach to support the development and application of STI policy in the subregion.

24. The Senior Environment Officer, Policy Research, Planning and Information Unit, Ministry of Environment and National Beautification, Barbados, acknowledged the interventions made by the previous speakers. He noted the complexity of advancing STI within the region and acknowledged the role of the CARICOM Secretariat in trying to advance such in the past. He offered his country's experience with respect to efforts to secure international patents for a design project, noting the high demands of time, effort, and financial resources of the process. He further noted that even after securing the patents, very little investment took place in the subsequent seven years. Based on that experience, the Senior Environment Officer observed that the key problem lied in financing and sustaining an appropriate institutional ecosystem for moving patents forward from innovation to commercialization. In summary, he suggested the need for an ecosystem supportive of STI development with an investment portfolio with input from the private and financial sector.

25. The Managing Director of KMA Consulting Limited revisited the issue relating to the decline of R&D in the Caribbean. She suggested that this was mostly a post-independence phenomenon, which was caused by a reduction in fiscal resources, as well as deficient research management that was critical for supporting R&D.

26. The Deputy Director for ECLAC subregional headquarters for the Caribbean raised the issue of the fourth industrial revolution (4IR), questioning more specifically if the prevailing STI strategies were preparing the subregion to engage in it. In relation to the decline in R&D, he offered that this was also driven by the adoption of structural adjustment policies by many Caribbean economies during the 1980s, and that this process precluded fiscal support to R&D. This notwithstanding, he reiterated the meeting's observation of the need for consistent investment in R&D as a requirement for the successful implementation of STI in the subregion, and cited Cuba as an example of where this had happened. The Deputy Director also suggested the need for the States to be more actively involved as collaborative partners with the private sector to drive R&D and STI. In this regard, he felt that the specific role of the State should be to promote the development of basic science, and to facilitate more Science, Technology, Engineering, Arts and Mathematics (STEAM) in national education systems.

27. The Council Member of the Caribbean Academy of Science took the floor to endorse the point raised by the previous speaker in relation to the need to have consistent investment in R&D, as was done in the case of Cuba, if the subregion was to have success with STI.

4. Closing of the meeting

28. The Associate Environmental Affairs Officer thanked all participants for their contributions and explained that the expert group meeting was part of ECLAC's external review process undertaken to improve studies carried out by the organization. He also provided a summary of the main points and arguments raised by the participants in the previous agenda point.

29. The Coordinator the Sustainable Development and Disaster Unit noted the importance of STI to the subregion's sustainable development, and that it should be integrated into all aspects of a country's sustainable development agenda. She then went on to thank the experts for their participation and contributions during the expert group meeting and noted the continued commitment of ECLAC in continuing to treat the issue of STI as a priority. She thanked the authors for the research undertaken on this important issue. The Coordinator also thanked the staff of the Sustainable Development and Disaster Unit, as well as other staff members of ECLAC for the support provided during the preparations of this meeting.

Annex I

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