SPOTLIGHT

Unleashing Potential: Collaborative Research as a Catalyst for Capacity Building and Enhancement

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INTRODUCTION

Collaborative research is a powerful way to build capacity across various domains, from academia to industry (Gamo et al., 2010). At its core, collaborative research is characterized by shared objectives, mutual trust, and collective problem-solving (Lang et al., 2012; Moeenian et al., 2022). Here, we describe the project entitled SARgassum risk across the Atlantic: building capacity for Transformational Adaptation in the Caribbean and West Africa (SARTRAC, https://sartrac.org), which brought together researchers from the global North and South from 2019 to 2023 (**Figure 1**). Institutions involved included the University of Southampton and the University of York (UK), University of Ghana (Ghana), Mona GeoInformatics Institute (Jamaica), and University of West Indies-Mona and -Cave Hill campuses (Barbados). The objectives were to investigate the drivers behind the *Sargassum* influx, understand the biology of *Sargassum*, develop early warning systems, identify alternative uses for *Sargassum*, and educate the vulnerable communities who are significantly impacted by its presence. We show how this collaborative research enhanced capacities, bridged knowledge gaps, and fostered innovation, and explore how projects like SARTRAC can serve as dynamic platforms for holistic development.

FIGURE 1 (above). The SARTRAC (SARgassum risk across the Atlantic: building capacity for Transformational Adaptation in the Caribbean and West Africa) team is gathered here following an insightful workshop at the University of Ghana, June 20, 2022.

FIGURE 2 (right). A *Sargassum* influx is shown at its peak in Esiama Beach, Western Region, Ghana, emphasizing the importance of collaborative work to understand this phenomenon.

PROJECT DESCRIPTION

KNOWLEDGE SHARING AND TECHNOLOGY TRANSFER

SARTRAC facilitated the exchange of knowledge and best practices among regions affected by *Sargassum* inundation. This aspect of collaboration is crucial for addressing a transboundary issue that impacts multiple regions across the Atlantic. The project supported the development and sharing of monitoring tools, management strategies, and technological solutions. For example, remote-sensing technologies and data analytics tools developed by the Global North were adapted and utilized by the Global South. This technology transfer helped both regions benefit from each other's advancements and innovations. Knowledge sharing also occurred through joint research efforts and publications. Collaborative research projects produced valuable data and insights that were shared across borders, enhancing the collective understanding of *Sargassum* blooms and their impacts. Also, for the first time, partners from the North observed *Sargassum* inundation in real time. While *Sargassum* provides habitat and food near or at the ocean's surface for many marine species, it also has a range of negative impacts when excessive amounts of this brown algae are carried to shore (**Figure 2**). The negative impacts include clogging of fishing nets and outboard motors; fouling of beaches during decomposition, producing pungent hydrogen sulfide; and itching of the skin when in contact with *Sargassum*. These impacts disrupt the livelihood of community members and affect tourism and the hospitality industry. This shared knowledge between the North and South helped inform better practices for management of *Sargassum* blooms and policy decisions related to these blooms.

INTEGRATED MONITORING AND DATA COLLECTION

SARTRAC emphasized the importance of integrated monitoring and data collection systems. The project supported the development of comprehensive monitoring networks that track *Sargassum* blooms across the Atlantic. Monitoring the growth and movement of *Sargassum* involved the use of satellite imagery, collection of in situ observations, and modeling tools. Collaborative data collection permitted development of a more accurate and detailed understanding

of bloom behavior and impact. Data from different regions were shared and analyzed collectively, providing a broader perspective on the issue. This integrated approach helped identify trends, predict future blooms, and assess the effectiveness of management strategies. The project also focused on standardizing data collection methods to ensure consistency and comparability across regions. This standardization enhanced the reliability of the data and facilitated more effective analysis and decision-making.

COMMUNITY ENGAGEMENT AND STAKEHOLDER INVOLVEMENT

Effective community engagement was a cornerstone of SARTRAC's collaborative approach. The project recognized that *Sargassum* blooms directly affect local communities, and their involvement is crucial for developing practical and acceptable solutions. SARTRAC engaged with coastal communities through consultations, workshops, and participatory planning processes. This engagement helped identify community needs, preferences, and local knowledge, which are essential for designing effective management strategies.

Involving the communities also fostered a sense of ownership and responsibility for managing *Sargassum* blooms. By working closely with local stakeholders, SARTRAC ensured that solutions were tailored to the specific context of each community and that they had the necessary support to implement them successfully. Furthermore, it ensured continuity even when the project reached the end of its lifespan. All participating community members were included on a web platform that enabled research members to stay in contact and the community members to communicate directly with researchers on *Sargassum* influx events. Researchers still receive near-daily updates of such events. SARTRAC trained teachers from selected community schools on *Sargassum* biology and the possible uses of this algae. They were expected to teach school children about *Sargassum* with the idea that this knowledge would be passed on to other members of the community.

POLICY DEVELOPMENT AND ADVOCACY

The project also played a role in policy development and advocacy by bringing together policymakers from different regions. SARTRAC supported the creation of policy frameworks and regulations that addressed the challenges posed by *Sargassum* blooms. Collaborative policy development involved sharing experiences and best practices from different regions, as well as engaging with international bodies and organizations. Four SARTRAC project members visited Barbados March 4–11, 2023, to share knowledge in order to facilitate policy direction in *Sargassum* management in Ghana (Marsh et al., 2023). This collaborative approach helped create cohesive and effective policies that can be adopted and implemented across different jurisdictions.

SARTRAC's advocacy efforts aim to raise awareness about the *Sargassum* issue and promote the adoption of evidence-based policies. By working with policymakers, the project helps ensure that the solutions and strategies developed are supported by appropriate regulations and resources.

RESULTS/OUTPUT

The results of SARTRAC's collaborative research approach include identification of atmospheric and oceanographic drivers of *Sargassum* blooms; development of an operational monitoring system at local to regional scales; analysis of the biological composition of the *Sargassum* biomass and implications for its re-use; completion of multiple publications, presentations, and seminars; and development of an active website as well as support of offshoot mini projects that have led to the creation of citizen scientist groups in all the communities. SARTRAC also developed *Sargassum* teaching materials that are available to both teachers and students.

LESSONS LEARNED

Inter-regional collaboration strengthened partnerships by leveraging experiences from both regions to develop context-specific and innovative solutions. Community and other stakeholder engagements were pivotal factors in the success of the project. They ensured ownership and must be seen as an integral part of any collaborative, community-based research. Open lines of communication both within the research team and among researchers and communities also ensured openness and confidence in proffered solutions.

CONCLUSION

The SARTRAC project exemplified collaboration through its international partnerships, multidisciplinary approach, capacity-building efforts, knowledge sharing, integrated monitoring, community engagement, and policy development. By bringing together diverse stakeholders and expertise from the Caribbean, the United Kingdom, and West Africa, SARTRAC addressed the complex challenges posed by *Sargassum* blooms in a comprehensive and integrated manner.

This collaborative effort not only enhanced the understanding of *Sargassum* blooms and their impacts but also empowered local communities and stakeholders to effectively manage and adapt to these challenges. Through its inclusive and participatory approach, SARTRAC contributed to building resilience and sustainability in regions affected by *Sargassum*, demonstrating the power of international cooperation in tackling global environmental issues.

REFERENCES

Gamo, F.J., L. Sanz, J. Vidal, C. de Cozer, E. Alvarez, J.-L. Lavandera, D.E. Vanderwall, D.V.S. Green, V. Kumar, S. Hasan, and others. 2010. Thousands of chemical starting points for antimalarial lead identification. *Nature* 465:305–310, https://doi.org/10.1038/nature09107.

Lang, D.J., A. Wiek, M. Bergmann, M. Stauffacher, P. Martens, P. Moll, M. Swilling, and C.J. Thomas. 2012. Transdisciplinary research in sustainability science: Practice, principles, and challenges. *Sustainability Science* 7:25–43, https://doi.org/10.1007/s11625-011-0149-x.

Marsh, B., W. Sowah, B. Oppong, and R. Anderson. 2023. *Fieldtrips, Meetings and a Symposium in Barbados, March 2023*. SARTRAC, https://www.sartrac.org/news/?story_id=8.

Moeenian, M., A. Khamseh, and M. Ghazavi. 2022. Social innovation based on collaboration between government and non-governmental organizations in COVID-19 crisis: Evidence from Iran. *Infectious Diseases of Poverty* 11(1):13, https://doi.org/10.1186/s40249-021-00923-3.

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