ADVANCING BWC CONFIDENCE-BUILDING MEASURES IN SOUTHEAST ASIA: LEVERAGING ASEAN'S PLATFORMS AND MECHANISMS

AUTHORS
Mely Caballero-Anthony
Julius Cesar Trajano
Jeselyn

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Centre for Non-Traditional Security Studies,
S Rajaratnam School of International Studies (RSIS),
Nanyang Technological University (NTU), Singapore

RSiS S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
Nanyang Technological University, Singapore

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1. Introduction

Confidence building measures (CBMs) are an important mechanism in the implementation of the Biological Weapons Convention (BWC). They are designed to prevent ambiguities, doubts, and suspicions, and foster trust among State Parties. To this end, successive Review Conferences of the BWC, and the annual UN General Assembly resolutions, have consistently urged States Parties to submit annual CBM reports as a means of promoting transparency and strengthening international cooperation in the peaceful uses of biological science and technology. While they are not declarations nor a substitute for verification and thus cannot be treated as tools for assessing compliance, they nonetheless provide valuable information particularly in identifying opportunities for assistance and cooperation.

Since the BWC lacks a verification or inspection mechanism, the CBMs serve as a crucial vehicle for translating the BWC's objectives into practice. They are the only formal tool available for States to demonstrate transparency and accountability in their biological activities. While the CBMs are not legally binding, they carry significant political weight. They are more than a voluntary exercise, intended to be regularly submitted by States Parties as part of their political commitment to the Convention. However, despite their importance, the vast majority of States Parties neither submit CBM reports consistently nor make full use of the information contained in existing reports.

In this policy report, we investigate both the strengths and shortcomings of the current CBMs under the BWC in Southeast Asia and identify how existing ASEAN's regional confidence and trust-building mechanisms could offer valuable insights for enhancing these measures. Additionally, we analyse current initiatives by both state and non-state actors in Southeast Asia to integrate and enhance CBMs at national and regional levels. We explore potential "CBM-Plus" strategies to complement the adoption of BWC CBM reporting mechanisms in the region. We identify concrete opportunities and pathways to increase transparency and information sharing in the region while improving national capacity to implement the BWC. We argue that ASEAN and its Member States have mechanisms to develop alternative CBM-Plus approaches for enhancing transparency and trust-building. Some might even contend that these approaches are more effective than BWC's formal CBM submissions, which are not publicly available and therefore have limited impact on broader regional transparency.

Our data, findings and recommendations are mostly based on the "RSIS Workshop on Revisiting Biological Weapons Convention's Confidence-Building Measures: ASEAN Perspective", which we convened from 18 to 19 September 2025 in Singapore. In this workshop, we facilitated expert group discussions bringing together 25 biosecurity and BWC experts from the Asia-Pacific region and beyond. These experts come from diverse professional fields, including public health, national security, academia, laboratory management, UN agencies, and the life sciences sector. The workshop examined the strengths and limitations of current CBMs and proposed ways in which existing ASEAN regional mechanisms can provide valuable lessons and complementary role for strengthening BWC-related CBMs.

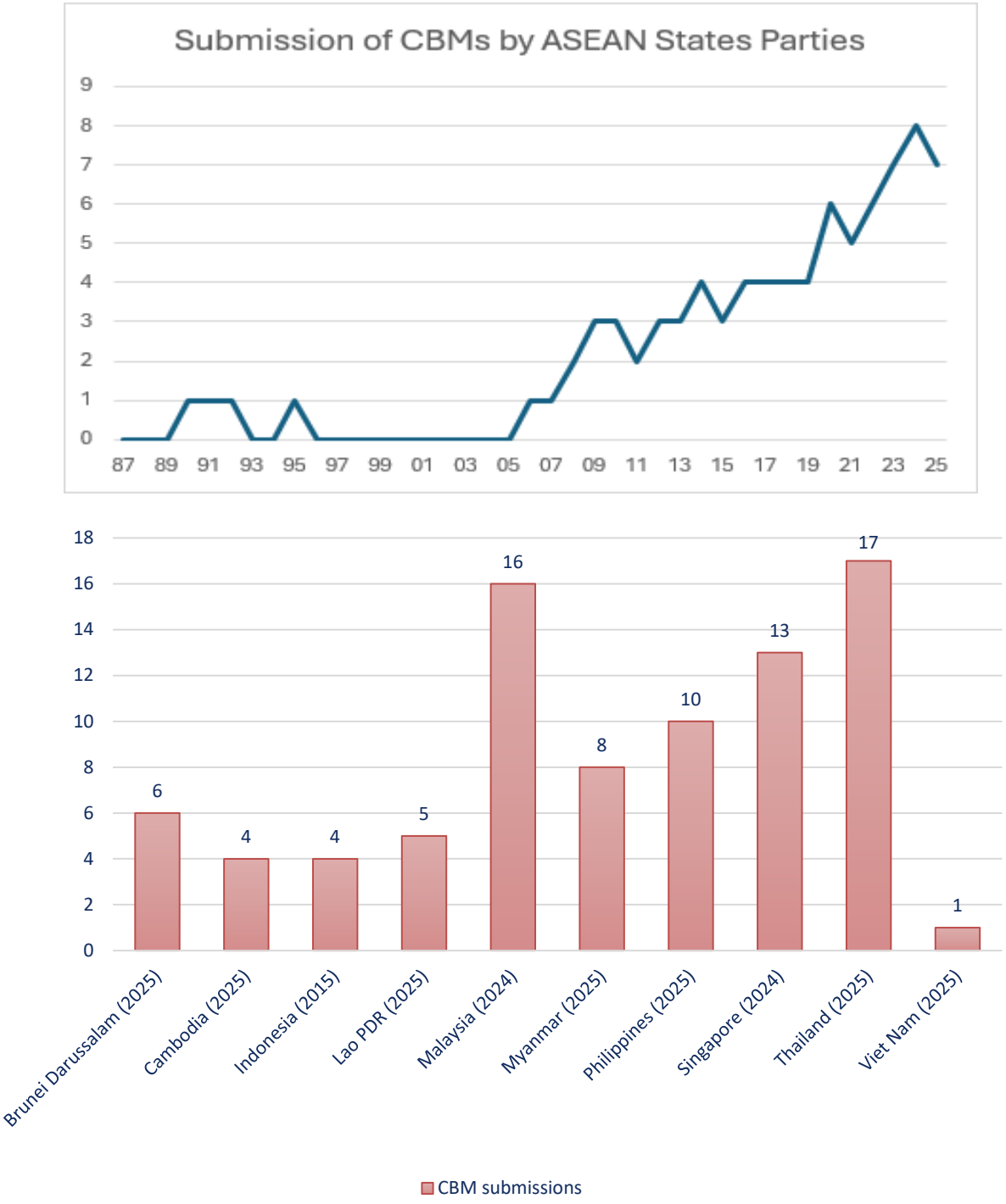
2. The State of BWC CBM Reporting in Southeast Asia

The Southeast Asian region comprises countries with diverse understandings and priorities concerning biosecurity and addressing biological threats. These threats range from emerging infectious diseases, laboratory biosecurity, dual-use research of concern, to malicious use of life sciences and bioterrorism. Effective adoption of the BWC therefore requires whole-of-government and multi-stakeholder approach. Ministries and agencies responsible for health, defence, agriculture, education, and science and technology should coordinate closely in preparing submissions. Collaboration should also extend beyond government to include industry partners, academic institutions, and biosafety and biosecurity associations. Such inclusive coordination strengthens national reporting capacities and reinforces a shared commitment to transparency, thereby making the BWC more operational and meaningful in practice.

Southeast Asia's growing biotechnology investments, emerging biodefense interests, and differing national capacities in biosafety and biosecurity oversight present both opportunities and challenges for the region. These dynamics can also heighten misperceptions surrounding biodefense programmes, making transparency through the BWC's CBMs especially valuable. Active participation of Southeast Asian States Parties in CBM reporting not only enhances transparency but also ensures that regional realities and priorities—rather than solely those of global powers—are reflected in international biosecurity norms.

Beyond CBMs, fostering a culture of responsible state behaviour and responsible science is essential. This involves enabling states to demonstrate their commitment to responsible conduct in biological research and security governance, while cultivating a scientific culture grounded in safety, ethics, and accountability.

All ASEAN States Parties have submitted at least one CBM report, signalling progress in regional transparency and confidence building. Most have maintained regular submissions in recent years, and these reports, which are shared exclusively among States Parties, generally provide detailed national information. However, a persistent challenge remains. Nearly half of Southeast Asian States Parties struggle to meet the annual 15 April deadline annually, underscoring the need for stronger compliance mechanisms and capacity building support.



Source: United Nations Office for Disarmament Affairs, CBM Report Submissions, 2025, https://bwc-cbm.un.org/.

As at 2024, eight out of ten Southeast Asian countries had submitted their reports, with Vietnam making its first submission in 2025. Cambodia has been submitting regularly since 2022, while Lao PDR began in 2024. Indonesia, however, has not made any submissions after 2015, prompting a workshop in the country aimed at encouraging renewed participation. With around 131 countries having submitted their CBM reports as at September 2025[1], and further efforts are underway to encourage more submissions before the end of the year, it is timely to examine how Southeast Asian State Parties are contributing to global transparency under the BWC.

The 2024 CBM cycle provides a useful snapshot of regional progress, revealing both areas of maturity and gaps that persist across different reporting forms. The following sections outline key trends across ASEAN States Parties, highlighting developments in laboratory capacities, disease surveillance transparency, responsible science initiatives, national legislation, historical declarations, and emerging models of regional cooperation.

High-Containment Laboratories and Biodefense Activities

Based on 2024 CBM reports for Form A submission in Southeast Asia, there are currently no operational BSL-4 laboratories, although one is under construction. All States Parties in the region maintain BSL-3 facilities, alongside many BSL-2 laboratories. Notably, only one State Party has declared a national biodefense R&D program, aimed at advancing research and technology to strengthen defence against biological threats.[2]

Disease Outbreak Reporting and Surveillance Transparency

Regarding Form B on the exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins, the 2024 CBM reports show that the vast majority of ASEAN States Parties submitted "Nothing to Declare." A few States referenced reporting under international frameworks such as the World Health Organization (WHO) International Health Regulations and World Organisation for Animal Health through World Animal Health Information System, and also outlined their national reporting responsibilities, designated institutions, and relevant weblinks. However, CBM Form B was not utilised by any ASEAN State Party.[3]

Promotion of Responsible Science and Research Transparency

Observations from the 2024 CBM reports show that for the utilisation of Form C, only a few States Parties provided information on relevant publications and government efforts to promote openness and public dissemination of biological research for peaceful purposes in accordance with the BWC's goals. Some also included references to publication policies or provided weblinks to relevant institutions.[4]

National Legislation and Regulatory Frameworks

Concerning the publication of relevant legislation, regulations and other measures (Form E), ASEAN States Parties have adopted different approaches in implementing domestic measures under the BWC. These include the enactment of standalone BWC laws or policies, a broader Chemical, Biological, Radiological, and Nuclear Weapons of Mass Destruction legislation, and implementation through various existing laws and regulations. Most ASEAN States Parties reported having key legislation in place, and the majority appear to have adopted relevant regulations. Several ASEAN States Parties also provided information on their national legislation, regulatory frameworks, and other measures related to BWC implementation.[5]

Historical Biological Programmes and Vaccine Production

With regard Form F and Form G, no ASEAN States Parties declared any past offensive biological weapons programmes. One State Party reported a past defensive biodefence research and development programme aimed at strengthening national capacity to defend against biological threats. In terms of vaccine production, three ASEAN States Parties declared a total of seven facilities—four producing human vaccines and three dedicated to animal vaccine production.[6]

Regional Capacity-Building Programmes

Capacity-building cooperation projects have been intensified in Southeast Asia with the aim of raising BWC and biosecurity awareness and encouraging states to regularly submit CBM forms. Cooperation among States Parties plays a crucial role in strengthening the implementation of BWC. A notable example of such collaboration is the Japan-funded regional meeting on the BWC held in Geneva, Switzerland in 2021, which paved the way for a cooperative project between the Philippines and Lao PDR. This initiative exemplifies North–South cooperation, where Japan's support facilitated capacity building among Southeast Asian States.

Following this, Lao PDR sought funding assistance from the European Union's CBRN Centres of Excellence (COE) to enhance its capacity in preparing and submitting its CBM report. experts from the Philippines worked closely with Lao PDR officials—first through a series of online workshops, and later through an in-person, two-day training session. This process represents a dynamic model of South–North and South–South cooperation, demonstrating how regional partnerships can effectively build technical expertise, promote transparency, and advance collective implementation of the BWC in Southeast Asia.[7]

From 2022 to 2023, the Philippines, which has steadily gained experience in Confidence-Building Measures for BWC, worked with Lao PDR in a "country-to-country training" program to raise awareness about CBM under the BWC and to provide hands-on training on how to make CBM submissions. Its successful outcome was the submission of Lao PDR to complete and submit its first CBM report to the ISU, BWC.[8] This bilateral training program provided by the Philippines for Lao PDR was cited at the Ninth BWC Review Conference in 2023 as a model for intra-regional cooperation. This accomplishment highlighted the role of regional expertise and cross-country collaboration in developing and delivering training that enhances national efforts to implement international legal frameworks and conventions aimed at mitigating biosecurity risks.[9]

3. Strengths and Limitations: Moving Beyond CBM Reporting Templates

As mentioned in the previous section, it is evident that the only formal transparency mechanism under the BWC is the annual submission of the CBM forms. While these forms are often criticised for being outdated and the second-best option given the absence of any verification body, they nonetheless function as more than a perfunctory paperwork exercise.

At first glance these appear to be little more than questionnaires, but their impact is significant. While the forms are the visible output, the process of compiling them often generates the real confidence-building effects. Preparing a CBM requires ministries and agencies to share information about laboratories, legislation, disease outbreaks, and related activities. That exercise, collecting, checking, and reconciling data, forces a degree of openness that would not otherwise occur. It nurtures habits of cooperation across government, creates professional relationships, and signals to other states parties a willingness to be transparent.

3.1 Strengths of the Current CBM Practice

One of the most obvious strengths of the CBM regime is the way it promotes inter-ministerial and inter-agency collaboration. Compiling the report inevitably draws together multiple domestic

actors, which has proven valuable in countries where biosecurity responsibilities are scattered across ministries.

Cambodia, for example, began its CBM preparations in 2022 with six agencies participating under the National Authority for the Prohibition of Chemical, Nuclear, Biological, and Radiological Weapons (NACW). Within two years, 12 agencies were jointly involved, evidence that CBM processes can expand cooperation and create enduring networks.[10]

Singapore has experienced a similar dynamic. The Ministry of Defence now works closely with the Ministry of Health to align security and public-health perspective during the reporting process.[11] Thailand has gone even further by establishing a BWC Coordinating Committee at the National Centre for Genetic Engineering and Biotechnology (BIOTEC) under the Ministry of Higher Education, Science, Research and Innovation. Comprising eight government agencies, the committee ensures that scientific and defence expertise are fully integrated into the report.[12] These cases show that CBMs act as an internal coordination mechanism, helping states build the “whole-of-government" approaches that biosecurity demands.

CBM Report also provides a form of domestic transparency and oversight. Although they are intended to inspire confidence among other BWC state parties, the process of collecting information creates a national transparency loop. As different agencies submit data, they also see what their counterparts are doing. This cross-checking exercise surfaces overlaps or gaps in national biosecurity policies and builds a common understanding of the country’s biological landscape. To the government's advantage, this could be utilised as one of the few routine reviews of domestic biosecurity activities, keeping the issue on decision-makers' radar and reinforcing internal accountability.

3.2 Limitations

Despite these contributions, structural weaknesses limit the CBMs’ effectiveness. A persistent problem is the disconnect between dialogue and reporting. Participation in CBM enhancement workshops or BWC meetings does not guarantee that the same individuals compile the national forms. Diplomatic representative may attend conferences, while technical staff handle submissions back home. Knowledge gained in discussions often fails to reach those who actually fill out the forms, undermining both the quality and the continuity of submissions.

A related limitation is the lack of supporting laws and frameworks in many state parties. National biosecurity legislation remains incomplete in numerous jurisdictions. Without a strong legal base for pathogen control, laboratory oversight, or enforcement, the data gathered for CBMs is often patchy. The absence of clear domestic rules makes reporting an improvised exercise and weakens the credibility of the information provided.

There is also a significant inconsistency among National Contact Points (NCPs). Each country designates NCP to oversee CBM preparation, but their mandates and institutional homes vary widely: foreign affairs, health, defence, or science agencies. These differences create uneven priorities and reporting styles, making submissions difficult to compare across countries and sometimes internally inconsistent. A health-ministry NCP may emphasise outbreak reporting, while defence-ministry NCP might focus on facility declarations, and the current CBM template does not accommodate these variations.

Another serious weakness is the exclusion of major key stakeholders. CBM preparation committee rarely involves biorisk associations, scientists, private laboratories and pharma industry, even though these groups conduct much of the relevant research and are often best placed to identify risks. Their participation could improve data quality and build trust between government and the scientific community, but current practice seldom includes them.

Finally, the international handling of submissions is largely passive. The BWC's Implementation Support Unit (ISU) serves only as a repository for CBMs reports. It lacks a mandate to analyse submissions, highlight discrepancies, or provide feedback. Without any evaluative function, CBMs cannot evolve into a genuine verification tool. States receive little incentive to improve the depth or timeliness of their reports and opportunities for learning from each other's practices are lost.

These shortcomings illustrate a tension at the heart of the current CBM process. CBMs are meant to build confidence, yet when reports are late, incomplete, or inconsistent, they can instead erode trust. States parties may question whether their counterparts are fully committed, which undermines the very objective the measures were designed to achieve. Nevertheless, their domestic value, stimulating inter-agency coordination, promoting internal transparency, and keeping biosecurity visible, remain significant. For many governments, these side benefits are the main reason the CBM process endures despite its voluntary and lightly institutionalised nature.

4. CBM-Plus Processes: How ASEAN's CBMs can contribute to BWC Implementation in Southeast Asia

To address the shortcomings in the current CBM processes, Southeast Asian countries can pursue two complementary approaches to advance CBM and BWC implementation at both the domestic and regional levels. First, they can leverage regional mechanisms. Second, they can develop CBM-like transparency mechanisms tailored to the region's unique context and operational realities. These approaches are explained and illustrated below.

4.1 Building on Existing Regional Mechanisms

4.1.1 Leveraging the Achievements of Existing ASEAN Networks

ASEAN's existing regional mechanisms and networks provide valuable platforms to complement and reinforce the BWC's CBMs. By leveraging established regional platforms such as the ASEAN Defence Ministers' Meeting (ADMM) network and the ASEAN Chemical, Biological, and Radiological (CBR) Defence Experts Network, Member States can strengthen transparency, coordination, and information-sharing in biological risk management. These regional frameworks not only enhance national and collective capacities but also help ensure that ASEAN's approach to biosecurity remains cohesive, practical, and aligned with the broader objectives of the BWC.

The ASEAN Chemical, Biological, and Radiological (CBR) Defence Experts Network**,** was established in 2017 under the ADMM to strengthen ASEAN's capacity to address non-traditional security threats. Over the past six years, the network has organised an extensive range of activities, including 12 technical workshops on chemical, biological, and radiological issues, and

one ASEAN Regional Forum (ARF) Workshop on Detection, Response, and Deterrence of Biological and Radiological Incidents, alongside three bilateral visits, four tabletop exercises, and six annual meetings. Comprising 18 chemical, 17 biological, and 16 radiological experts from ASEAN Member States, the network has made significant progress in developing harmonised protocols for CBR sample collection, chain of custody, and analytical reporting. [13]

Its main objective is to foster stronger professional and scientific linkages among defence experts and to promote sustained collaboration across sectors. By providing a directory and secure web portal for experts to communicate, share protocols, and seek technical assistance, the network has enabled practical laboratory cooperation and built trust among participants—a crucial foundation for effective regional biosecurity governance aligned with the objectives of the Biological Weapons Convention (BWC).

In 2023, the ASEAN Chemical, Biological, and Radiological (CBR) Defence Experts Network organised a week-long training in Singapore, focusing on biological, radiological and chemical preparedness. The workshop brought together experts from national, international and regional institutions including the International Atomic Energy Agency (IAEA), the EU CBRN Centres of Excellence, the Organisation for the Prohibition of Chemical Weapons (OPCW), and Singapore's Defence Science Organisation (DSO). Participants from all ten ASEAN Member States took part in hands-on training using DSO-developed kits designed for both civil and military use. Parallel sessions were also held for radiological and chemical training, with facilitation from global partners.[14] These activities exemplify ASEAN's practical efforts to enhance regional capacity and interoperability in CBR defence through shared technical expertise and joint training.

Through the network, ASEAN Member States shared diagnostic protocols including procedures for PCR testing of SARS-CoV-2 through the network's secure communication channels. The establishment of a dedicated web portal and the use of informal communication tools such as WhatsApp enabled timely sharing of information and strengthened cross-border collaboration among scientists and defence experts. Over the past two years, the network's members also collaborated to develop a harmonised set of standard operating procedures for CBR sample collection, chain of custody, international transportation, and analytical reporting. These harmonised protocols, developed through voluntary technical tracks led by different ASEAN countries, were formally endorsed by all ten Member States in 2023.

The adoption of harmonised CBR protocols represents a major milestone in enhancing regional transparency, interoperability, and preparedness for biological incidents—key objectives consistent with the BWC's CBMs. These protocols not only facilitate the safe and standardised handling of samples during potential CBR events but also strengthen trust and scientific cooperation among ASEAN Member States. Looking ahead, the network plans to conduct simulated sample-sharing exercises to test these protocols, with the goal of further strengthening regional coordination, collaboration, and response capabilities to CBR-related incidents.

Moving forward, the network is expected to serve as ASEAN's focal point for engagement with international organisations and as a platform for advancing collective peace, security, and scientific collaboration in support of the BWC.

4.1.2 Operationalising the Proposed ASEAN Biosafety and Biosecurity Network

To strengthen BWC CBMs in Southeast Asia, it is recommended to operationalise the proposed ASEAN Biosafety and Biosecurity Network, initially starting with a virtual platform. In the ASEAN Leaders' Declaration on Strengthening Regional Biosafety and Biosecurity, Southeast Asian leaders commit, inter alia, to "establish the ASEAN Biosafety and Biosecurity Network to enhance functions, roles, and responsibilities in facilitating knowledge sharing, coordination, and cooperation among ASEAN Member States, partners and relevant stakeholders".[15] This network could play a central role in regional CBM mechanisms by facilitating national cooperation, joint CBRN exercises, and collaborative training with foreign counterparts. Emerging areas such as cyber and technology-related CBMs, including AI ethics and bias, should be incorporated into combined training programs that also address maritime security, cyber defence, and disaster response alongside biosecurity. While establishing a fully resourced coordinating or command-and-control centre may face funding challenges, a virtual centre is feasible and could serve as a multipurpose hub for managing incidents and threats across the region.

Rather than creating an entirely new structure, a virtual centre on biosecurity could be developed to serve as a coordination and information-sharing platform with an established multiyear plan of action—drawing inspiration from models such as the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM), in the context of fostering collaboration among nuclear safety and security regulatory bodies from ASEAN Member States, and other existing mechanisms. Similar to these existing networks, crafting a plan of action is critical. Implementing the ASEAN leaders' declaration through developing a regional plan of action or roadmap would help flesh out the necessary deliverables from the ASEAN Biosafety and Biosecurity Network.

This approach recognises that the region already possesses considerable technical and institutional expertise. The key challenge moving forward is to connect and harmonise these existing networks, encouraging dialogue between the defence, health, and foreign affairs communities. Experiences from recent ASEAN workshops demonstrate the value of such cross-sector engagement: while public health actors often face constraints in sharing information, defence counterparts tend to have more established systems for coordination and response. Leveraging these strengths through an integrated, networked approach will help enhance regional transparency, preparedness, and implementation of the BWC's CBMs.

4.1.3 Engaging National Biorisk Associations in CBM Processes and Science Diplomacy

National biorisk/biosafety/biosecurity associations and regional biosafety networks should be actively involved in the implementation of BWC CBMs at both the national and regional levels. These organisations possess valuable technical expertise and established professional networks that can enhance transparency and strengthen biosecurity governance. Organising regular workshops and dialogues that include these associations would facilitate information sharing, promote best practices, and encourage broader stakeholder participation in CBM processes—an approach that aligns with their demonstrated interest and commitment to advancing biosafety and biosecurity standards in the region.

National biorisk/biosafety/biosecurity associations in the region have been recently providing biosecurity and BWC awareness seminars and guiding documents. For example, the Biorisk Association of Singapore and the Biorisk Association of the Philippines have been organising

national workshops covering DURC governance, cyberbiosecurity and biorisk management training.[16] The Indonesian Biorisk Association has been convening national training workshops on biosecurity awareness and principles. Such capacity building workshops and conferences can promote broader awareness on BWC, as well as information and knowledge exchange among biorisk and biosecurity associations within ASEAN.[17]

Biorisk associations can facilitate science diplomacy given the emerging security risks of AI and biotechnologies. BWC is fundamentally a treaty about science—its provisions are grounded in the peaceful use, regulation, and responsible advancement of biological research. To ensure that scientific developments continue to inform BWC implementation, there is a pressing need to strengthen science diplomacy within the Convention's framework. The ongoing discussions on establishing a Science and Technology (S&T) mechanism represent an important step toward creating a formal process for integrating scientific expertise and evidence-based input into BWC deliberations and decision-making.

A noteworthy regional example is the *Singapore Biorisk Code of Conduct for the Life Sciences Industry and Professionals* developed by the Biorisk Association of Singapore in 2022. This code provides practical guidance on ethical and responsible conduct in biological research and serves as a valuable model for promoting responsible science within the BWC context.[18] Despite its significance, this initiative has not yet been highlighted in meetings of States Parties. It should be formally recognised and cited in future BWC discussions as an example of good practice from Southeast Asia, demonstrating how regional initiatives can contribute meaningfully to global biosecurity governance.

Biorisk associations in ASEAN have shown growing and promising interest in the BWC's CBMs signalling a positive shift toward broader stakeholder engagement in biosecurity governance. Traditionally, discussions on CBMs have been confined to a small circle of policy and diplomatic actors. However, recent exchanges reveal that national and regional biorisk associations are now actively recognising the value of integrating CBM-related elements into their existing programmes, such as biosafety training, simulation exercises, and professional exchanges. This interest demonstrates that these communities—comprising biosafety officers, scientists, and laboratory professionals—are not only aware of the BWC's objectives but are also eager to contribute to its practical implementation.[19] Their involvement offers valuable insights drawn from on-the-ground experiences in biosafety and biosecurity management, which can help identify gaps and propose relevant measures to strengthen regional CBM practices. This development highlights the potential for biorisk associations to serve as vital partners in enhancing CBM awareness, fostering cross-sector collaboration, and building a more inclusive and sustainable biosecurity culture in Southeast Asia.

4.1.4 Strengthening BWC CBM Implementation through South-South Cooperation and Peer Support

To enhance the quality, frequency, and comprehensiveness of CBMs by ASEAN Member States, a regional peer support mechanism rooted in South-South cooperation could be developed. This approach would enable countries in the region to learn directly from one another's experiences, challenges, and best practices in implementing the BWC and preparing CBM reports. The peer support model recognises that countries with similar administrative systems, resource constraints, and regional security concerns are better placed to provide practical, contextually relevant guidance to each other than external actors. A general peer support exercise could take the form of workshops, joint training programmes, or Track 1.5 dialogues that bring together

technical experts and government officials from across the region. These initiatives would allow for open exchanges on CBM reporting practices, national coordination mechanisms, and challenges encountered in inter-agency collaboration. For example, ISU's planned workshops on BWC CBM in Indonesia and Timor Leste in first quarter of 2026 will include experts from other ASEAN Member States to share practical insights on how they manage their CBM submissions and coordinate among various government agencies.

Singapore's ongoing initiative to establish a regional training centre for biosecurity and biosafety offers a promising model. The centre could initially function virtually, hosting online workshops and training sessions for officials and experts across ASEAN, before evolving into a physical hub for regional training and collaboration. Importantly, participation in these programmes should be cross-sectoral, welcoming both defence and civilian agencies, particularly from health and agriculture, as not all biosecurity capabilities reside within defence sectors. This inclusive and collaborative approach would reflect the multidimensional nature of biosecurity and ensure that ASEAN's CBM capacity-building efforts are comprehensive and sustainable.

To ensure sustainability and higher visibility, ASEAN could institutionalise these exchanges and peer support by establishing an ASEAN Network of BWC Coordinators or Agencies, akin to the ASEANTOM in the area of nuclear security and safety. This forum would bring together designated national BWC focal points to report progress, share updates, and raise implementation challenges to the attention of ASEAN ministers and leaders. The SOM could serve as a coordination and accountability mechanism to keep biological disarmament and biosecurity on the ASEAN agenda, while enhancing the visibility of regional initiatives among donors and international partners.

4.2 Exploring New CBM-like Transparency Mechanisms

The following recommendations outline five areas where states in the region and by extension the global community can pioneer CBM-like initiatives: boosting biosecurity education, creating a roster of biosecurity and BWC experts, establishing collaborative pathogen inventory software, conducting in-situ peer review exercises, and promoting the role of civil society. Each of these proposals aims not only to reduce risks but also to foster a culture of trust, accountability, and collaboration that is indispensable for the evolving biosecurity landscape.

4.2.1 Boosting Biosecurity Education

Education forms the cornerstone of any effective biosecurity regime. Across Southeast Asia, biosafety is well integrated into laboratory training, yet biosecurity is less systematically addressed. This gap is particularly concerning given the rapid advances in biotechnology and artificial intelligence, which make sophisticated biological manipulations more accessible to a wider range of actors. Without targeted education, scientists and policymakers may fail to recognise the dual-use potential of their work or to establish adequate safeguards.

An innovative CBM-like measure would be the creation of an international and regional network for biosecurity education**.** Such a network could function both as a resource hub and a collaborative platform, bringing together universities, laboratories, and policymakers across borders. It would standardise biosecurity training modules, ensuring that scientists in Singapore, Cambodia, or Japan, for example, are learning comparable content about responsible research, oversight mechanisms, and ethical norms. The network could employ modern teaching tools such as AI-enabled learning platforms, interactive simulations, and virtual exchanges to make

biosecurity education more engaging and scalable.

Crucially, this initiative would not remain confined to the classroom. A structured program of certifications could be developed, creating a pool of recognised biosecurity professionals across the region. This programme could serve as a more accessible alternative or a practical complement to ISO 35001, which is often prohibitively costly to obtain and maintain.[20] These certified individuals would serve as trusted interlocutors in international forums, capacity-building programs, and emergency responses. Over time, this pool of trained experts would contribute to a shared understanding of risks and best practices, building mutual confidence and reducing the likelihood of both accidents and deliberate misuse.

4.2.2 Creating a Roster of Biosecurity and BWC Experts

Another CBM-like initiative that could significantly strengthen trust and capacity in the region is the creation of a roster of biosecurity and BWC experts. This would follow the model of the ARF Experts and Eminent Persons (EEP) as well as the Chemical, Biological, and Radiological (CBR) Network under the ADMM, which has successfully maintained a roster of experts for training and emergency purposes.[21] A similar mechanism dedicated to biosecurity would ensure that expertise is not only developed, but also made readily available for regional and international needs.

This roster would serve multiple purposes. First, it would help preserve continuity in capacity building**.** Too often, participants in workshops or training events are chosen ad hoc and may not remain involved in follow-up activities. By contrast, a roster ensures that those who are trained become part of an institutionalised pool of resources, reducing the loss of institutional memory. Second, it would act as a knowledge-sharing hub, allowing governments and international organisations to quickly identify authoritative voices for technical consultations and policy guidance. Third, it could be used as a rapid response mechanism in emergencies, with experts mobilised across borders to provide advice or on-site support during biological incidents.

In addition, each country could nominate a national BWC champion from the roster who would act as a focal point for both regional collaboration and domestic implementation. These champions would ensure that international commitments are translated into national practice and that the benefits of capacity-building activities are disseminated locally. They would also provide a clear line of accountability and communication between states and the wider international community.

4.2.3 Establishing Collaborative Pathogen Inventory Software

Transparency around pathogens and dual-use biological technologies is one of the thorniest issues in biosecurity. Laboratories often keep internal records of their pathogen holdings, but these are rarely standardised or shared across institutions, let alone borders. This creates blind spots where risky materials may exist without sufficient oversight or awareness. Cambodia's recent experience in developing a pathogen inventory system provides a compelling model for addressing this gap.[22]

A novel CBM-like mechanism could be the development of collaborative pathogen inventory software at the regional level. This would function as a multinational platform for cataloguing dangerous pathogens and dual-use technologies in a secure and standardised manner. The system would not require states to disclose highly sensitive information, but could employ a tiered

access approach. National authorities would retain detailed control over their data, while aggregated information could be shared regionally to identify trends, overlaps, or gaps in capacity.

Such a database would bring several benefits. It would increase transparency by making clear where critical risks and resources are located. It would improve preparedness, as states would have a clearer picture of their regional landscape in the event of a cross-border outbreak. It could also promote efficiency, helping avoid duplication of expensive infrastructure by showing where certain pathogen-handling capacities already exist.

4.2.4 Conducting in-situ Peer Review Exercises

Peer review exercises represent one of the most promising CBM-like innovations. While joint research projects and information-sharing are valuable, they often lack the rigor and trust-building effect of direct, structured review. Peer review involves countries assessing one another's biosecurity systems, not to impose external judgments but to share experiences, identify best practices, and highlight areas for improvement.

The effectiveness of this particular peer review proposal lies in its on-site component. Unlike paper-based reports, which may be incomplete or overly optimistic, on-site evaluations allow reviewers to see laboratories, regulatory systems, and emergency protocols in action. This creates a level of transparency and confidence that no amount of paperwork can replicate. Importantly, the voluntary nature of peer review ensures that it remains a cooperative rather than punitive exercise.

For ASEAN and Northeast Asia, peer review exercises could start small, involving voluntary participation from a handful of states. These exercises could then be translated into BWC CBM submissions, providing a practical entry point to the reporting process. The reviews would not only strengthen confidence among participating states but also generate practical recommendations for improving national systems. Over time, as the practice becomes normalised, it could be expanded into a regular regional feature, much like peer review mechanisms in arms control or public health.

4.2.5 Promoting the Role of Civil Society

Finally, no biosecurity regime can succeed without the involvement of civil society. Governments and laboratories may be the primary actors, but civil society—academics, non-governmental organisations, journalists, and advocacy groups—play a vital role in ensuring transparency, accountability, and societal oversight. This has sometimes been described as a form of "biosecurity two-factor authentication," where societal verification complements official reporting and monitoring.

Civil society actors can contribute in several ways. They can conduct independent monitoring, raising awareness of risks that governments may overlook. They can help translate technical issues into language accessible to the broader public, thereby building societal awareness and resilience. They can also hold governments accountable for their commitments, ensuring that international obligations under the BWC are not neglected domestically. In contexts where public trust in government is fragile, the involvement of credible civil society actors can be particularly valuable.

Promoting civil society engagement requires intentional effort. Governments should create formal avenues for participation, such as advisory boards, public consultations, and partnerships in capacity-building initiatives.

5. Conclusion

This report has examined the role of CBMs under the BWC and their significance within the Southeast Asian context. While annual submissions remain a critical tool for promoting transparency and compliance, participation across the region has been inconsistent, reflecting capacity limitations and differing national priorities. Nonetheless, the process of CBM preparation itself has proven valuable in facilitating inter-agency collaboration, improving data management, and nurturing a culture of openness in biosecurity governance. These experiences demonstrate that CBMs forms can be more than reporting obligations; they can serve as a mechanism that strengthen national systems and foster mutual trust among regional partners.

ASEAN's long-standing emphasis on cooperative and comprehensive security positions it well to take on a stronger role as a regional norm-maker in advancing the objectives of the BWC. By integrating CBM-Plus-related information sharing, peer support and capacity-building into its existing security frameworks, ASEAN can promote a regional culture of transparency, trust, and responsible biological research.

Looking ahead, ASEAN Member States are well positioned to advance CBM implementation through regionally tailored initiatives. By leveraging existing mechanisms and institutional networks, and by developing new CBM-like transparency tools, the region can enhance collective preparedness and accountability without depending solely on the BWC framework. Such efforts could include regional peer-review exercises, shared information platforms, or even civil society engagement. Pursuing these measures would not only complement the BWC's objectives but also contribute to a safer, more resilient, practical, and transparent regional biosecurity architecture.

ABOUT THE AUTHORS

Professor Mely Caballero-Anthony holds the President's Chair for International Relations and Security Studies at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University (NTU) Singapore, where she also serves as the Head of the RSIS Centre for Non-Traditional Security Studies (NTS Centre) and Associate Dean (International Engagement). She leads the Biosecurity and International Security focus area at the Asia Centre for Health Security (ACHS). Her research focuses on regionalism and multilateralism in the Asia-Pacific, non-traditional security, human security, nuclear security, peacebuilding, and global governance. She has led several global and regional research projects on international security and global governance, and has held key leadership roles in major international networks and institutions, including as Secretary-General of the Consortium on Non-Traditional Security Studies in Asia since 2008 and a member of the World Economic Forum's Global Council on Nature and Security and the International Climate Security Expert Network.

Mr Julius Cesar Trajano is Research Fellow at the Centre for Non-Traditional Security Studies (NTS Centre), S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University (NTU) Singapore. He is part of the NTS Centre's Biosecurity and International Security programme and coordinates the Centre's nuclear security research programme. He has co-authored policy reports, commentaries and articles on biosecurity and biotechnology governance, nuclear security, and climate security in Southeast Asia. He is among the co-organisers of the recently convened Study Group on Biosecurity and Health Security in the Asia-Pacific under the Council for Security Cooperation in the Asia Pacific (CSCAP). His latest publications include Emerging Biosecurity Landscape in Southeast Asia (RSIS, 2025) and "Biosecurity in the Changing Global Order: The Case of Southeast Asia" (Asia Policy, 2025). He is currently the Chair of the Asia-Pacific Regional Group of the International Nuclear Security Education Network.

Ms Jeselyn is Research Analyst at the Centre for Non-Traditional Security Studies (NTS Centre), S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University (NTU) Singapore. She is involved in the NTS Centre's Biosecurity and International Security programme. She conducts policy analysis on the emerging biosecurity landscape in the Asia-Pacific, the impact of emerging technologies such as artificial intelligence (AI) on biosecurity, and the nexus of climate, peace and security. She holds a Master of Science (MSc) in Asian Studies from RSIS, and a Bachelor of Arts in International Relations from Tokyo International University.

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