

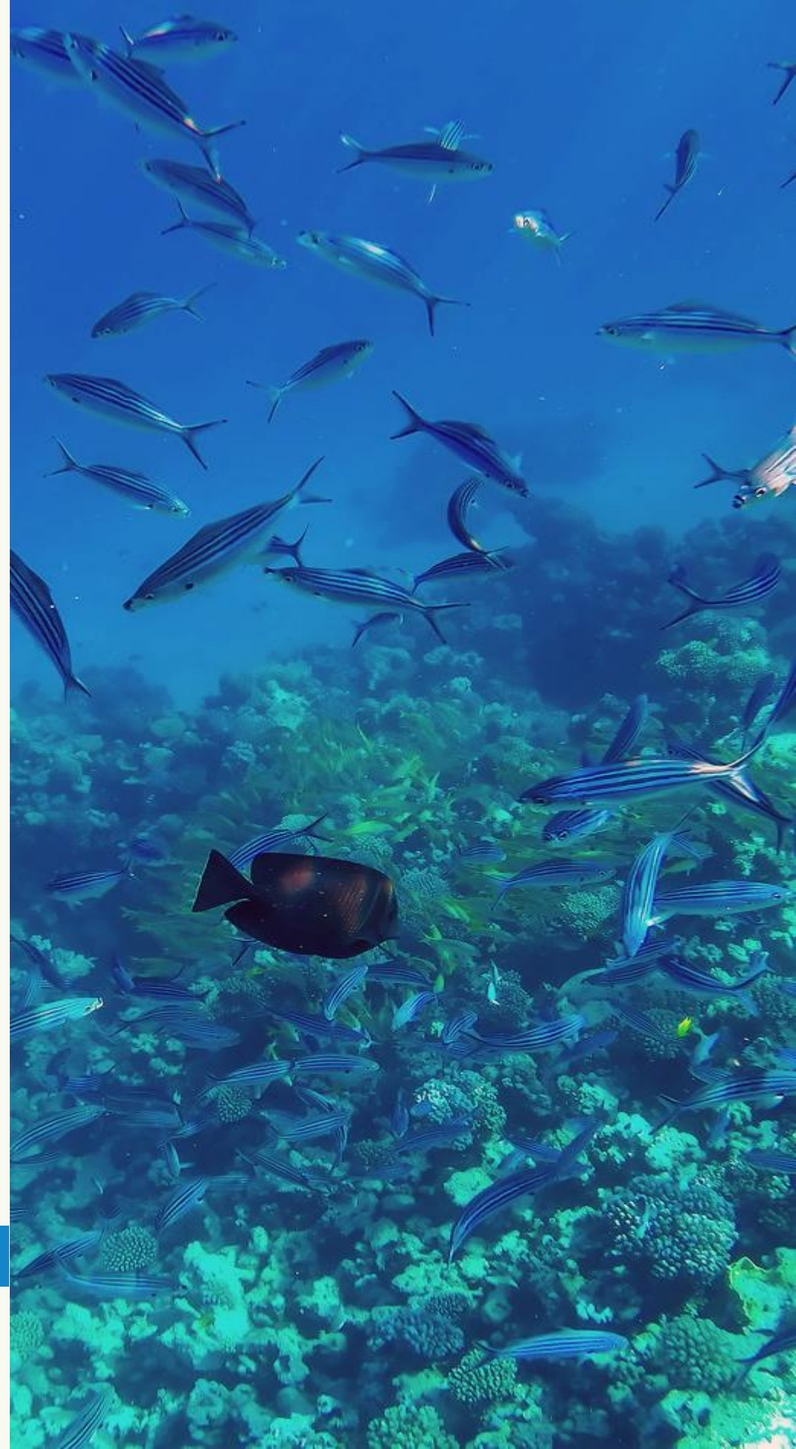
WESTPAC-HAB

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Summary Outline

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1. Justification (project duration: 4 years)

Under the changing ocean environment with climate change, more frequent Harmful Algal Bloom (HAB) has been observed and its geographical coverage has been also expanded. The HABs cause health problems and fish kills, which are risks for human well-being and sustainable seafood provision to the society. Mitigation and management of the impact by HABs to the society is a common urgent issue of countries in the WESTPAC region to achieve sustainable development, especially to meet the target 14.2 of the SDGs Goal 14 on sustainably managing and protecting marine and coastal ecosystems to avoid significant adverse impacts by strengthening their resilience.

The HABs are natural phenomenon and cannot be stopped their occurrences. Therefore, holistic understanding and measures based on multidisciplinary and even transdisciplinary approaches are important to address problems caused by HABs. Based on this understanding, the program aims at promoting transdisciplinary HAB science under the UN Ocean Decade.

Based on the strong natural science on HABs accumulated through long-time WESTPAC-HAB programme, transformative science would be promoted through effort of engaging various stakeholders to better address various problems caused by HABs. From the natural science side, understanding biology and ecology of phytoplankton and identification of causative species including morphology among others are the very basis to adequately address occurrences of HABs to choose necessary measures for mitigation. To early detect and issue warning to the society, novel techniques such as meta-barcoding and DNA analysis are expected to be utilized. From the social science side, to develop and maintain monitoring system to be effective, analysis of social system including administrative structure and relationships among stakeholders, i.e., national and local governments as management and monitoring bodies, fisheries including aquaculture industries as producers of shellfish and fish, and citizens as consumers are necessary.

2. Project/WG objectives

Long-term objectives of WESTPAC-HAB program since its establishment in 1989:

- Understanding of the biological and chemical nature, population dynamics and environmental effects of harmful algae and their bioactive products.
- Prevention of ill consequences caused by HABs, through providing scientific knowledge useful for establishment of reliable cost- and load-effective management systems including monitoring and research.

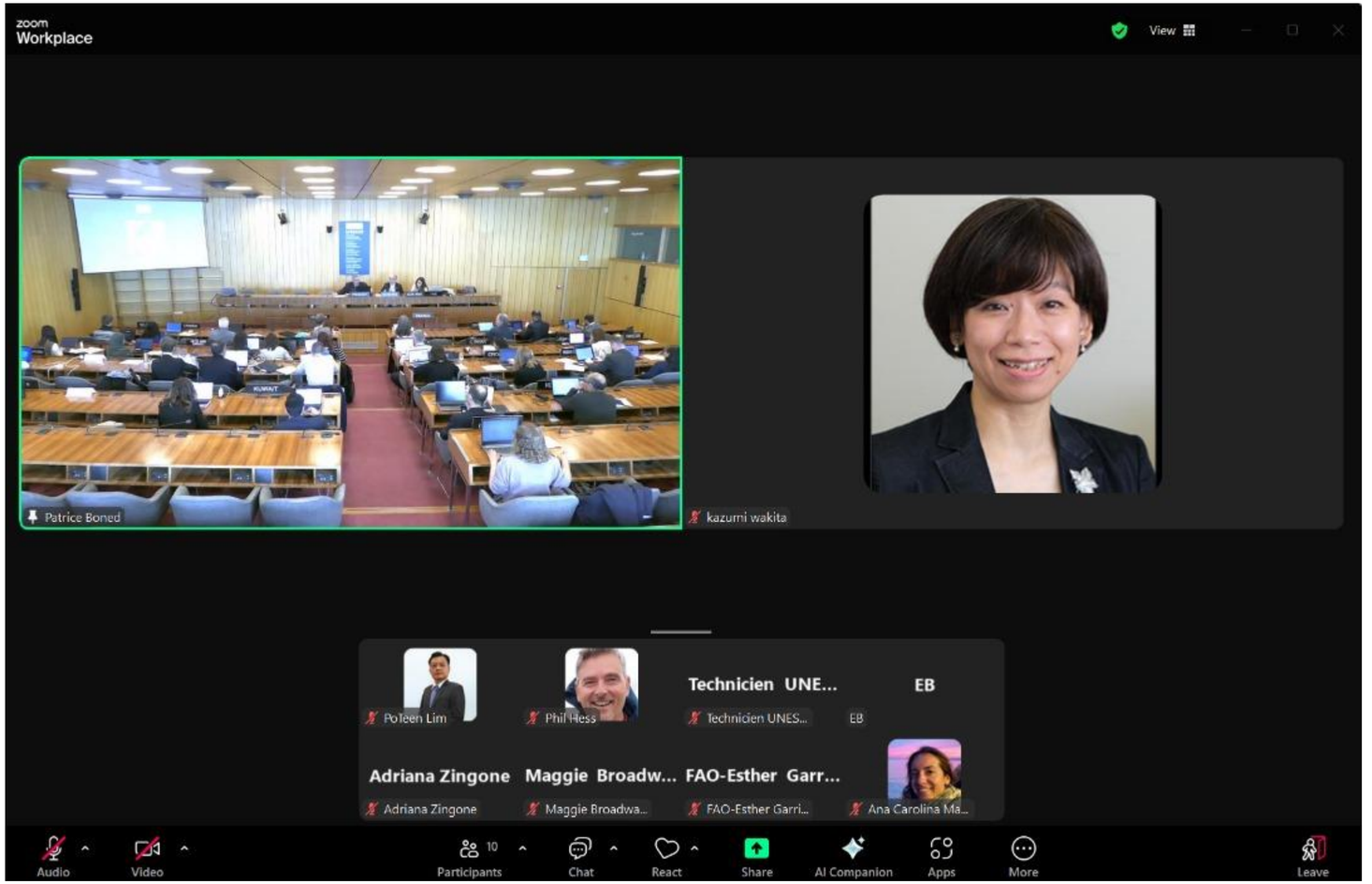
Specific objectives for this timeframe (4 years):

- To contribute to advancing HAB monitoring programmes and community-level awareness and preparedness through regional workshop on effective approaches for strengthening community participation, integrated HAB monitoring approaches including conventional microscopy, molecular detection and automated methods.
- To develop a HAB status report of the WESTPAC region, which will be a basis for the member countries to better understand the trend, emerging issues, scientific progress such as ecology, physiology, toxicity of HABs species, and socio-economic aspects and mitigation and management of HABs.
- To coordinate the exchange of HABs information especially on emerging issues among the member states and all HABs-related organizations.

3. Major Activities and Outputs (1)

- **Represented WESTPAC at the IPHAB: Bridging Region to Global**

  - WESTPAC-HAB co-leads joined the online IPHAB Session in 2025, presented activities of WESTPAC-HAB, and let international societies to know the status of and challenges regarding HAB in the Western Pacific region so that regional context can be better incorporated into the international HAB program.



3. Major Activities and Outputs (2)

- **Convened two Scientific Steering Committee (SSC) meetings: Shared HAB status reporting of member countries, identified country needs, and developed a workplan 2028-2029.**

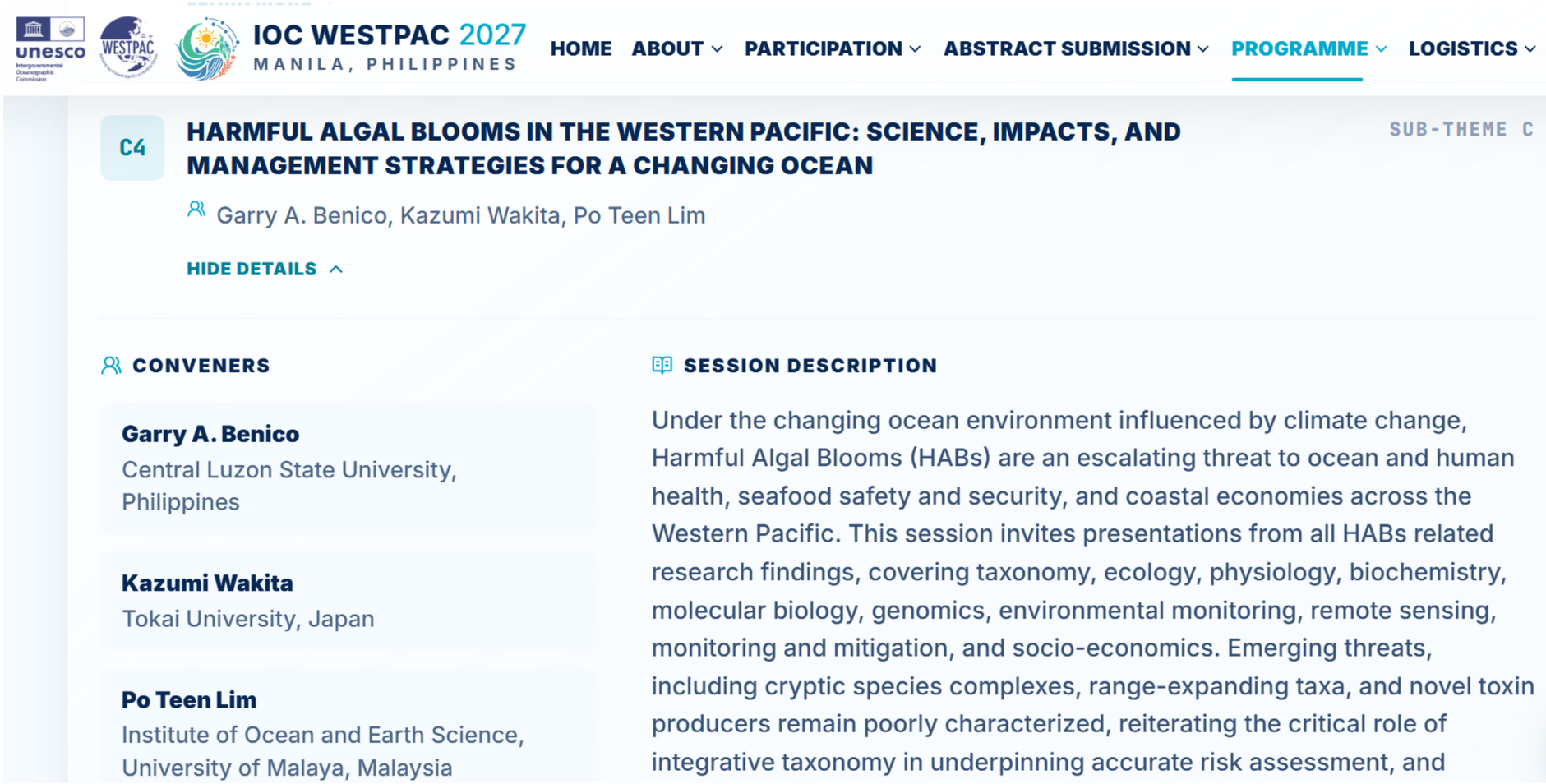
Country needs identified at the online SSC meeting

- Strengthening early detection and warning of fish-killing and toxin-producing HAB
- Improving preparedness for changes in HAB species, distribution, seasonality, and toxicity associated with climate change
- Strengthening HAB monitoring by integrating conventional microscopy with molecular detection methods
- Enhancing regional information exchange on emerging HAB species, bloom events, and associated fisheries and aquaculture impacts

4. Anticipated activities and outputs in 2027

Convening a session at the IOC WESTPAC 2027

- exchange the latest status including emerging issues and scientific findings on HABs.
- identify knowledge gaps and necessary science, policies, and measures to reduce risks to society.
- explore solutions in monitoring, capacity development, and public awareness.



5. Biennial Workplan for 2028-2029

No.	Activity / Output Description	Expected Result / Output	Y1-1st H	Y1-2nd H	Y2-1st H	Y2-2nd H	IOC RP Budget (USD)	XB Required (USD)	Lead Responsibility
HLO 2 — EFFECTIVE WARNING SYSTEMS AND PREPAREDNESS FOR TSUNAMIS AND OTHER OCEAN-RELATED HAZARDS									
Expected Result 1.2 (Sub-obj. 2.2 + 2.3): Coastal hazard information products and Tsunami Ready preparedness and enhanced									
2.2.1	Contribute to advancing HAB monitoring programmes and community-level awareness and preparedness • Conduct a regional workshop on effective approaches for strengthening community participation in HAB monitoring networks in Indonesia (number of participants will depend on the budget availability) • Conduct a follow-up regional workshop on integrated HAB monitoring approaches, including conventional microscopy, molecular detection and automated methods in Indonesia (number of participants will depend on the budget availability) • Support Member States in developing or advancing HAB monitoring porgramme and enhancing community-level HAB awareness • Develop a regional HAB status report through IOC publication	A regional HAB status report published through IOC publication; Succes and challenges of engaging communities in HAB monitoring shared; Conventional and unconventional techniques of HAB's detection and species identification equipped or enhanced; Communities' awareness on HAB enhanced; HAB monitoring programme developed or advanced	●	●	●	●	10,000	10,000	

6. Strategic recommendations for future development

- Key insights, lessons learned, and specific recommendations for enhancing the project's impacts and visibility

Challenges

- Lack of funding support to conduct face-to-face activities, e.g., learning unconventional techniques, etc.
- Lack of involvement of other stakeholders (government agencies, NGO) due to limited financial resources
- Lack of holistic data to better predict occurrences of HABs especially due to climate changes

Recommendations

- Strengthen tie/communication with national and local government agencies
- Solicit support from various sources, e.g. national governments, private sectors, donors and etc.
- Promote monitoring and data collection which covers changes of sea use, e.g. aquaculture development
- Further promote "science to the society" by collaborating with various stakeholders in each country
- Engage involvement of active young HAB scientist in the program