

Outline for the progress report on (Enhance the Capacity for Species Identification and Genetic Analysis on Marine Organisms in the Coral Reef Ecosystems in the Western Pacific – Third Phase (DRMREEF- III))

1. Introduction and justification

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The Western Pacific region has the world's highest concentration of coastal marine biodiversity and endemism, and a significant portion of the human population here depends on fisheries for their livelihood. The Coral Triangle in the region, referred to as the "Amazon of the Seas", is the epicenter of marine life abundance and diversity on the planet. It has more than 600 coral species (more than 75% of all known coral species), 53% of the world's coral reefs, 3,000 fish species, and the greatest extent of mangrove forests of any region in the world.

To conduct a scientifically credible conservation and rational use of the marine biological resources for sustainable development, it is important to establish and provide baseline information on the extent of the current biodiversity and its dynamics. Therefore, this project aims to build the regional and national capacity for species identification with a genetic method, DNA Barcoding, and eventually to make an inventory of the marine organisms living in the Coral Triangle and neighboring coral reefs containing biological and ecological information as precisely as possible alongside other traditional taxonomic tools and alternative forms of molecular systematics. The project had completed its first phase (March 2013- Dec 2014) and second phase (January 2016-January 2018) with a lot of outputs: i. regional research network well established among relevant institutes that are experienced in the taxonomy of marine organisms in the coral reef ecosystem and interested to develop their capacity for DNA taxonomy in the identification of marine organisms in reef ecosystems; ii. Member States' capacity enhanced for species identification and genetic analysis on marine organisms in the coral reef ecosystems in the Western Pacific, through a number of trainings and science workshops; iii. An inventory of marine organisms living in the coral reefs in WESTPAC countries developed and shared among member countries for the assessment of biodiversity. Following the demands of participating institutes, the 3rd phase of this project was developed to further enhance the capacity of WESTPAC member states for using the genetic method for species identification, encourage data sharing and collection, keep constructing the established portal site, and apply this tool to marine resources management and biodiversity conservation.

2. Timeframe and objectives

The third phase of the project (DRMREEF-III) was originally planned for the period from April 2019 to March 2021, but it has been extended to June 2023.

DRMREEF-III will build on the research network and capacity established over the previous two phases and achieve the objectives:

- To expand the inventory of marine organisms living in the coral reefs in WESTPAC countries and share the information among member countries for the assessment of biodiversity;
- To monitor recruitment of the reef organisms by analyzing the larvae and fries, operation of recruitment monitoring site(s):
- To compile and publish a WESTPAC marine biodiversity book, as a final result, focusing on the regional level distribution and the barcoding information

3. Major activities, outputs & outcomes over the last intersessional period (May 2021- April 2023)

- 1) Maintenance and Expansion of the WESTPAC Marine Biodiversity Portal
- 2) Publication of a book on coral reef fishes:
 - Kazi Ahsan Habib et al. Reef Fishes of Saint Martin's Island Bangladesh, an identification book with DNA barcodes (May 2021)
- 3) Publication of papers:

Restricted distribution

- Kazi Ahsan Habib et al. 2021. DNA barcoding of brackish and marine water fishes and shellfishes of Sundarbans, the world's largest mangrove ecosystem. PLoS ONE 16(8): e0255110.
 - Norli Fauzani Mohd Abu Hassan Alshari et al. 2021. Metabarcoding of fish larvae in the Merbok river reveals species diversity and distribution along its mangrove environment. Zoological Studies 60-76.
- 4) Preparation of publishing a marine biodiversity book entitled 'Probing into Marine Life with DNA barcode in the Tropical Indo-Pacific'

4. A summary of key achievements since its establishment

- 1) Regional and national capacity building on marine species identification using the genetic method 'DNA barcoding' through several workshops
- 2) Establishment of WESTPAC Marine Biodiversity Portal which holds thousands of marine species information on taxonomy, photograph and DNA barcode
- 3) Publication of books and papers

5. Self-assessment on implementation against objectives

Among the three objectives of the project, the first one to expand the inventory of marine organisms living in the coral reefs in WESTPAC countries and share the information among member countries for the assessment of biodiversity has been achieved successfully. The second objective to monitor recruitment of the reef organisms by analyzing the larvae and fries by operation of recruitment monitoring site(s), on the other hand, has not been attempted for achievement due to the COVID-19 pandemic situation. The third objective to compile and publish a WESTPAC marine biodiversity book, as a final result, focusing on the regional level distribution and the barcoding information is underway for completion by June 2023.

6. Problems encountered and recommended actions

The prolonged COVID-19 pandemic has resulted in negative impacts on the project by preventing gathering and carrying out field research, which has made the second objective of the project to monitor recruitment of the reef organisms not be attempted. The pandemic situation has also delayed compiling and publishing a WESTPAC marine biodiversity book. Therefore, the end-time of the project is extended from April 2021 to June 2023 so that the publication be completed by that time.

The deliverables and timeframe for the book publication is planned as follows:

- Draft manuscript of the book by 27 March 2023
- Edited manuscript in word file to WESTPAC by 10 April 2023
- Final edited work of the manuscript by 24 April 2023
- Printing the book by 15 May 2023

7. Objectives to be achieved, if applicable, over the next intersessional period (May 2023- April 2025)

(not applicable)

8. Planned activities for May 2023- April 2025

(not applicable)