



## International Coral Reef Initiative (ICRI)

Member's Report | 37<sup>th</sup> General Meeting

19<sup>th</sup> – 23<sup>rd</sup> September 2023 Hawai'i, – United States of America

**Reporting Period: 2021 – 2023**

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### A. Member Information:

- Name of ICRI member: **Republic of Maldives**
- Name of person(s) completing member's report: Shafiya Naeem, Muhsina Abdul Rahman
- Email: [shafiya.naeem@mmri.gov.mv](mailto:shafiya.naeem@mmri.gov.mv), [muhsina.abdulrahman@environment.gov.mv](mailto:muhsina.abdulrahman@environment.gov.mv)
- Are you a Focal Point:  Yes  No
  - If no, who are you completing the form on behalf of:
- Which was the last General Meeting you attended: ICRI GM 36 (2022, online)
- Will you be attending the 37<sup>th</sup> ICRI General Meeting:  Yes  No
- Member social media:
  - Twitter: @MMRI\_Maldives
  - LinkedIn:

**B. Reporting on the implementation of ICRI Plan of Action 2021-2024: turning the tide for coral reefs.** *Your responses will help inform the Secretariat about members' contributions toward the current Plan of Action*

**Theme 1 - Preparing for the Future: Promoting Resilient Coral Reefs**

*1.A - Strengthening policies - Supporting conservation and recovery of coral reefs and associated ecosystems through resilience-based management frameworks.*

- (ICRI) How have you embedded resilience-based management into your policies? (Tip – refer to the RBM policy brief: <https://icriforum.org/resilience-hub/>)

*Answer:*

- *[The Strategic Action Plan 2019-2023](#) of the Maldives have key policies on resilience-based management. In this regard, 79 protected areas have been established under the Environment Act 4/93, in the Maldives covering almost 13% of coral reef area. Additionally, 5 sites have been established as grouper management sites under the Fisheries Act. Maldives is working towards establishing 20% fully protected areas in the EEZ of the Maldives focusing on off-shore large marine protected areas too. [The Guideline on Other Effective areas based conservation measures](#), allows the house reefs surrounding the resort islands to be recognised for the conservation efforts.*

*1.B - Promote capacity building for applying resilience-based management approaches to coral conservation Ad Hoc Committee on Resilience-based Management.*

- (ICRI) Please list any examples of leading practices, techniques and strategies for building reef resilience that your organisation/country is involved in. Include their location and extent, methods of implementation, financing, and an assessment of their results (or likely results), with links for more information if possible.

*Answer:*

*The Maldives began the National Coral Reef Monitoring (NCRM) Program in 1998 following the mass bleaching event. As part of this program 16 sites from six atolls were established as long-term monitoring sites. Additional sites and atolls were included over the years and by the end of 2021, 31 sites from the atolls Haa Dhaal, Noonu, Raa, Baa, Lhaviyani, Kaafu, Alif Alif, Gaaf Alif and Addu (Seenu) have been selected for long-term monitoring in the NCRM program. For more information on long-term monitoring sites please refer to the report [Status and trends of hard coral cover derived from long-term monitoring sites in the Maldives 1998-2021](#)*

*The NCRM Program is government financed and implemented by Maldives Marine Research Institute.*

*In the 23 years of NCRM program, three types of methods were used to gather benthic data from the long-term monitoring sites. From 1998-2005, triplicate 50m Line Intercept Transects (LIT) were used. From 2009- 2015, using the Reef Check methodology quadruplicate 20m*

*Point Intercept Transect (PIT) were used, and in 2015 quadruplicate 20m PIT were used based on National Coral Reef Monitoring Framework (NCRMF) Protocols. From 2017, the program started using photo quadrats for benthic evaluations, and initially used CoralNet for annotations. In collaboration with Australian Institute of Marine Sciences' we now use Reef Cloud, an open-access platform to collate and analyse our photo quadrat data (<https://reefcloud.ai/>).*

*Data gathered from 1998-2021 in the NCRM program has been analysed and published. Coral cover trends were analysed using Bayesian hierarchical generalized mixed models in three different analyses. Here we will highlight the broadscale model assessing the overall coral cover trend of the country. The model showed coral cover declines with matched with stress events such as minor and major bleaching, with varying magnitudes of decline observed for each event. Following each stress episode, overall, the reefs showed capacity for recovery at a national scale. For more information on the analysis and results please refer to the report [Status and trends of hard coral cover derived from long-term monitoring sites in the Maldives 1998-2021](#)*

*We have re-launched our CoralDatabase, an online repository to collect and manage data on coral reef ecosystems in December 2021 (<https://www.coraldatabase.gov.mv/>). CoralDatabase is a national repository and aims to establish collaborative monitoring of reef and coastal ecosystems. All of the National Coral Reef Monitoring Framework (NCRMF) Protocols are published and available for download. One of the major aims for CoralDatabase was to expand the coverage for coral monitoring by including civil society in the data collection.*

*Upon the relaunch we have conducted workshops to train citizen-scientists and staff from tourist resorts primarily resort marine biologists on NCRMF protocols and on the use of CoralDatabase. CoralDatabase was initially developed from funding from World Bank as part of Climate Change Adaptation Project (CCAP) Maldives and is now fully government financed.*

- (ICRI) Have you developed, or are you aware of, training materials that you can share?

*Answer:*

*All of the National Coral Reef Monitoring Framework (NCRMF) Protocols are published and available for download <https://www.coraldatabase.gov.mv/protocols>*

#### *1.C - Promote and build capacity for the restoration of resilient coral reefs Ad Hoc Committee on Reef Restoration*

- (ICRI) Please list any examples of reef restoration mechanisms that your organisation/country is involved in. Include their limits, conditions of implementation, financing and an assessment of their results, with links for more information if possible.

*Answer:*

- *The country has a National Coral Reef Restoration program that was established in 2019. The program led by MMRI aims to adapt techniques that have been developed for the Maldives and facilitate better connectivity of restoration projects throughout the country.*
- *MMRI is working closely with CSIRO to support the development and implementation of restoration methods that use coral larvae. One of the limiting factors with implementation of this method in the Maldives is limited knowledge regarding coral spawning timing, spatial variation, and fecundity. In addition, the method is relatively new in the country so there is a lack of, albeit growing, personnel with the necessary knowledge, skills, and techniques. Lack of resources also means that existing methods need to be adapted to suit and function with what's available in the Maldives. As part of a DFAT funded project, CSIRO and MMRI conducted training workshops targeting locals on larval based restoration techniques, conducted an expedition in three atolls to better understand spatial fecundity, and published an SOP for larval based restoration of Maldivian coral reefs (<https://publications.csiro.au/publications/publication/PIcsiro:EP2023-1605>)*
- *A CORDAP proposal based on larval restoration and implementation through local communities led by Dr. Peter Harrison with partners from SCU, CSIRO, MMRI, Maldives Coral Institute and local scientists has been approved. The project is likely to begin later this year.*
- *At a small scale, fragmentation-based restoration is the most common method employed in the country. These projects often led by resort marine biologists are short lived and poorly monitored partially due high turnover of resort staff and partially because some projects function as means of making money. To support monitoring efforts by projects that use fragmentation-based methods and enable easy direct comparisons as well facilitate knowledge exchange and communication within the country, a coral reef restoration monitoring manual has been published. The manual was developed by the MaRHE center and MMRI (<https://coraldocsproduction.blob.core.windows.net/docs/c5eefd7-5b51-4f1e-9cba-b4a95cb8c678.pdf>).*

## Theme 2 – Coral Reef Science and Oceanography: Advancing and Utilizing the Latest Science and Technology

### 2.A – Coral monitoring capacity building

- (ICRI) Do you have information / case studies that could contribute to the update of the “Methods for ecological monitoring of coral reefs” (<https://portals.iucn.org/library/efiles/documents/2004-023.pdf>), especially related to the use of new technologies.

Answer:

- *A potential case study for the update are the Maldives' National Coral Reef Monitoring Framework's reef monitoring protocols that take advantage of a combination of old and new techniques to monitor reefs.*

- (ICRI) Are you aware, developing, or involved with, any capacity building activities related to the use of coral reef monitoring mechanisms, especially regarding the advancement of monitoring practices (noting technology)?

*Answer:*

- *We have published a protocol for collection for photo quadrats while snorkelling and diving recreationally that can help us with monitoring reefs. Surveyors can submit the photo quadrat data to the MMRI via the CoralDatabase. We then upload these photo quadrats to a special project in ReefCloud which helps us assess the state of a reef where images are submitted.*

## *2.B – The Global Coral Reef Monitoring Network (GCRMN)*

The GCRMN would like to receive feedback on the [Status of Coral Reefs of the World: 2020 report](#) to improve the production of future regional and global reports. As such, please kindly respond accordingly to the questions below:

- (ICRI) In reference to the Status of Coral Reefs of the World: 2020 report:
  - Have you read the report?
  - Did you utilise the report and/or use the results and contents?
  - How could the next report be improved (considering the entire process from data acquisition to reporting)?

*Answer:*

- *We have read the report.*
- *It is used as a reference for the current state of reefs within the South Asia region. The trend results of the region and the country were also used to validate trends that were derived in local reports.*
- *Locally, there had been some grievances that there was insufficient acknowledgement for the data that was shared in the report. There had been some frustration that the effort taken to collect data was lost and a sense of colonial science associated with the report. Development of a data paper(s), either for regional or complete datasets, simultaneously adjacent to the reporting process could appease some these grievances and frustrations as such a paper would directly acknowledge the data collection efforts and contribution to the data analysis. This would also facilitate open data which could also support research and management efforts at national scales as well.*
- *During the 2020 reporting process, the South Asia node was not active and undeveloped. Hence, there was limited engagement of South Asians within the reporting process (excluding the data call workshop). Though there has been talks and some movement with revitalising the South Asia node, this has been slow and there has been minimal/non-existent regional dialogue. Hence the following could improve the South Asia chapter:*
  - *More active involvement of South Asian scientists in the reporting process. Local Maldivian scientists have expressed their interest and are keen to engage and contribute to such a capacity.*

- *Support or facilitation to revitalise the South Asia node and develop a regional plan for monitoring and reporting.*
- *The paper report while a useful reference is not as effective as a tool in engaging with information dissemination/training/teaching the local public or those not actively engaged in coral reef or coral reef related research. An online dashboard as had been previously suggested in meetings may help with this.*
  
- (ICRI) The GCRMN intends to establish time-bound task forces to address specific priority issues and to build capability and capacity across the network. As a first priority, a Data Task Force was established. The Task Force brings together subject matter experts to increase the transparency, reproducibility, and robustness of future GCRMN reports alongside capacity in monitoring, data collection, analysis, management and sharing of coral reefs and associated ecosystems. The Task Force will focus on:
  - Improving data integration and analyses to facilitate the production of GCRMN regional and global reports; and
  - Promoting good data management practices based on FAIR data principles for the coral reef scientific community.

Tell us if you will be interested in joining the Data Task Force, or upcoming task forces. More so, please inform us if you have data to contribute to upcoming regional, or global, reports and if you will be organising and/or partaking in any capacity building activities regarding data monitoring:

*Answer:*

1. *Taskforces: The Maldives would be interested in joining and contributing to the Data Task Force. Dependent on what the additional taskforces are, the Maldives may want to join/contribute to them as well.*
2. *Data to contribute (GCRMN Region Country, Data description): There is long-term monitoring and rapid monitoring data available that can be shared under data sharing agreements.*
3. *Upcoming capacity building activities: The MMRI are planning workshops targeting citizen scientists and resort marine biologists to familiarise them with the Maldives' National Coral Reef Monitoring program protocols and the use of the CoralDatabase (the country's marine database and marine science collaboration platform). This has been a priority activity for us as the MMRI and the NCRM program has limited logistical and human resources that prevent the program to surveying sufficient reefs in the country to assess impact and state as accurately and precisely as possible. Additionally, as we're expecting worsening El Niño conditions, we need to be able to train as many people as possible to properly report and records its impact on the Maldivian reefs.*

### Theme 3 - Local Threat Reduction: Integrating Response Planning Frameworks

Please tick the most appropriate box/boxes:

- (ICRI) Do you have (or in the process of developing) a coral reef response plan(s) on, for example, but not limited to:
  - coral disease
  - vessel groundings
  - bleaching
  - invasive species outbreaks (lionfish and COTS)
  - large storm events
  - other:

If yes, please provide us with more information.

Answer:

*Bleaching: After the 2016 bleaching event, the Maldives developed a “Maldives Coral Bleaching Response Plan” (accessible via: <http://mrc.gov.mv/en/publications/show/maldives-coral-bleaching-response-plan>). To address insufficient short-term targeted action plan within the document, a need for specific guidance by stakeholders and industry and the anticipated impacts from the El niño in 2024, a supplementary “Alert level recommendations” has been drafted by the national Coral Bleaching Coordination Committee and is being discussed by the country’s cabinet for implementation. If approved, the document will be published and acted on moving forward.*

### Theme 4 - Diversity and Inclusion: Expanding the Coral Reef Community

4.A – Connect with youth audiences:

- (ICRI) Are you developing (or planning to develop) any communication campaigns or outreach materials? What will your primary target audiences be and what would your key messages include?

Answer:

- *With the redevelopment of the “Coral database” (accessible via: [coraldatabase.gov.mv](http://coraldatabase.gov.mv)), the national repository for marine data and information and marine science collaboration platform, the MMRI is currently developing training and outreach materials to encourage people to share data to better understand the national state of reefs. This campaign is also focussed on capturing the impact of potential bleaching due to the El Niño. Target audiences include students, recreational divers and snorkelers, CSOs and NGOs, and resort marine biologists. Key messages include the benefits of monitoring and managing their own reefs, the necessity of understanding the spatial and temporal state of national reefs, challenges with recording bleaching impacts.*

*4.B - Collaborate with Indigenous people and seek to incorporate indigenous and local knowledge into policies and management plans:*

- (ICRI) How do you incorporate indigenous and local knowledge into policies and management frameworks. Please provide us with some examples. Do you have any plans or strategies to further promote this incorporation?

*Answer:*

- *New policy and regulation development mandate consultation with local communities including the general public, island councils and atoll councils. These results of these consultations are then incorporated into new regulations and laws. This also applies to the development of biosphere reserves and protected areas. The new marine spatial plan that is being developed for the country also had extensive surveys engaging with local resources users to better understand the spread and diversity of use and how best to plan various areas in the spatial plan.*
- *Example, SAMPA, B atoll biosphere reserve, Addu, etc.*
- (ICRI) Do you have any, or know of, best practices to solicit Indigenous and local community knowledge?

### **C. Kunming-Montreal Global biodiversity framework**

- (ICRI) Do your current National Biodiversity Strategies and Action Plans (NBSAP) incorporate coral reefs? If not, what kind of material will be useful for your Country/organisation to ensure coral reefs are integrated in the revision of NBSAPs?

*Answer:*

*Yes. The existing NBSAP 2016-2025 covers coral reef. Additionally, there is ongoing work to revise the existing NBSAP to incorporate the GBF which will incorporate coral reefs.*

- (ICRI) How are you planning to implement the Kunming-Montreal Global biodiversity framework. For you, which targets are the most relevant for coral reefs?

*Answer:*

*There is ongoing work to revise the existing NBSAP to incorporate the GBF which will incorporate coral reefs.*

All the targets are important especially, Target 1, 2, 3 on area-based conservation, protection and restoration. Additionally, Maldives being a SIDS, and an atoll ecosystem, all targets have elements related to coral reefs that will be localised in the revised NBSAP.



**D. Upcoming events**

Please tick the most appropriate box/boxes:

- September 19<sup>th</sup> – 23<sup>rd</sup> 2023: 37<sup>th</sup> ICRI GM, USA, Hawaii
- 30<sup>th</sup> November – 12<sup>th</sup> December 2023: 28<sup>th</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change
- 26<sup>th</sup> February – 1<sup>st</sup> March 2024: 6<sup>th</sup> session of the United Nations Environment Assembly
- 10<sup>th</sup> – 12<sup>th</sup> April 2024: 2024 UN Ocean Decade Conference, Barcelona, Spain.
- 2024: United Nations Biodiversity Conference (COP16) of the Parties to the UN Convention on Biological Diversity (CBD), Turkey.
- Other

Please list any upcoming regional / international events relevant to ICRI that your organisation plans to attend:

**E. Publications.** Please list relevant publications / reports you have released recently (+ add a link if possible)

Publication	URL
<b>Status and trends of hard coral cover derived from long-term monitoring sites in the Maldives: 1998-2022</b>	Available via the Coraldatabase: <a href="https://coraldocsproduction.blob.core.windows.net/docs/5dbe2148-25c3-4eca-8cbf-4f7aa7cab503.pdf">https://coraldocsproduction.blob.core.windows.net/docs/5dbe2148-25c3-4eca-8cbf-4f7aa7cab503.pdf</a>  Available via MMRI website: <a href="http://www.mrc.gov.mv/assets/Uploads/MaldivesCoralReefReport-2022.pdf">http://www.mrc.gov.mv/assets/Uploads/MaldivesCoralReefReport-2022.pdf</a>
<b>Report of Protected Area Management Effectiveness Evaluations for three sites in the Maldives</b>	Available via the MECCT website: <a href="http://www.environment.gov.mv/v2/en/download/19886">http://www.environment.gov.mv/v2/en/download/19886</a>
<b>Standard operating</b>	<a href="https://publications.csiro.au/publications/publication/PIcsiro:EP2023-1605">https://publications.csiro.au/publications/publication/PIcsiro:EP2023-1605</a>

<p><b>procedures for larval-based restoration of Maldivian coral reefs</b></p>	
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**F. ICRI Member Feedback.** What do you find most valuable about being a member of ICRI as well as completing the ICRI member reports? If you have any ideas to improve the Member Reports, please list below:

**G. Contact information & member information.** (Note that this information will be posted on the ICRI website on your member page: <https://icriforum.org/members/>).

*Please use the table below to provide us updates to your member’s focal points as well as the blank cells to indicate changes to information (please add more rows, as needed):*

<b>Focal Point 1:</b>	
<i>Name:</i>	Shafiya Naeem
<i>Title/Organisation:</i>	Director General, Maldives Marine Research Institute
<i>Email:</i>	shafiya.naeem@mmri.govmv
<b>Focal Point 2:</b>	
<i>Name:</i>	Muhsina Abdul Rahman
<i>Title/Organisation:</i>	Assistant Director, Ministry of Environment, Climate Change and Technology
<i>Email:</i>	muhsina.abdulrahman@environment.gov.mv
<b>Focal Point 3:</b>	
<i>Name:</i>	Khadeeja Ali
<i>Title/Organisation:</i>	Senior Research Officer, Maldives Marine Research Institute
<i>Email:</i>	khadeeja.ali@mmri.gov.mv
<b>Member page updates:</b>	
<i>Section</i>	<i>Update</i>
<b>Do you have new resources (reports, guidelines etc.) that you would like to display?</b>	
<i>Resource description</i>	<i>URL</i>
Status and trends of hard coral cover derived from long-term monitoring sites in the Maldives: 1998-2021	<a href="https://coraldocsproduction.blob.core.windows.net/docs/5db2148-25c3-4eca-8cbf-4f7aa7cab503.pdf">https://coraldocsproduction.blob.core.windows.net/docs/5db2148-25c3-4eca-8cbf-4f7aa7cab503.pdf</a>



Status of bleaching in the Maldives 2016	<a href="https://coraldocsproduction.blob.core.windows.net/docs/2b153f84-0b04-43ea-ad78-fc2e04fbcd93.pdf">https://coraldocsproduction.blob.core.windows.net/docs/2b153f84-0b04-43ea-ad78-fc2e04fbcd93.pdf</a>
A rapid assessment of natural environments in the Maldives	<a href="http://www.environment.gov.mv/v2/en/download/10625">http://www.environment.gov.mv/v2/en/download/10625</a>
2020 Maldives coral reef assessment report	<a href="https://www.nooraajje.org/files/ugd/47d1fd_993e15f39aa6474dae789be839feeca0.pdf">https://www.nooraajje.org/files/ugd/47d1fd_993e15f39aa6474dae789be839feeca0.pdf</a>
Assessment of Maldivian coral reefs in 2009 after natural disasters	<a href="https://coraldocsproduction.blob.core.windows.net/docs/b93ef6cb-cf5d-4e86-a449-84a3d24dd180.pdf">https://coraldocsproduction.blob.core.windows.net/docs/b93ef6cb-cf5d-4e86-a449-84a3d24dd180.pdf</a>

*Thank you very much for sharing your valuable experiences and information with ICRI. Members reports, meeting outputs and resources will be uploaded to: <https://icriforum.org/events/37th-icri-general-meeting/>*