

Date of Activity/Field Work: 27th February to 16th March 2018

Venue: Abemama Island

Key Stakeholder: No stakeholder involved in our activity as it is mainly focus on the marine survey and ciguatera sampling

Name of person compiling report: Max Peter– Fisheries Officer for Research and monitoring Unit, Fisheries Division

- **Nature of Activity Undertaken**

List of sub-activities leading to this Activity undertaken on site

- Carry out marine survey on coral covers, finfish and invertebrate count at Bike and Abatiku site targeting the outer reef, back reef and lagoon habitat
- Collect algal samples using Halimeda algae for testing ciguatera in different marine habitat and not limited to reported areas of ciguatera cases
- Determining potential marine site toward recreational activities such as snorkelling, scuba and fishing

- **Objective(s)**

- The objective of this first activity in Abemama is to assess the status of the marine biodiversity focussing on corals covers and its diversity, and determining the abundance of finfish and invertebrate of highly importance to food security and income generation.
- The second objective is to determine the density of toxic dinoflagellates that cause ciguatera or fish poisoning
- To identify potential marine recreational site

Our activity output is fall under the output 1.3 and 2.4 which is Island research and outreach. The data we collected is highly significant toward the management of the marine resources at both the Island and national level to build adaptive capacity of vulnerable communities to ensure and preserve food security under the conditions of climate change

- **RESULTS ACHIEVED**

There were 2 sites studied; Bike and Abatiku. From these 2 sites the different habitat of outer reef, back reef and lagoon were drawn and studied using a 100 m transect with 3 replicates. Thus in total 18 x 100 meter transects were laid and done in Abemama. Our findings for coral cover, finfish and invertebrate are discussed below:-

- Outer reef habitat

Figure 1:- Outer reef habitat showing its coral cover and invertebrates

The outer reef habitat provides a greater home to a number of corals, finfish and invertebrate.

The complexity of the coral cover is high as they are more densely aggregated forming a continuously and coherent reef system. The fish diversity and abundance is high consisting of important reef food such as Snappers, Emperor fish, Groupers, Wrasses, Parrortfish, Surgeonfish, Triggerfish and Goatfish. The dominant fish sizes are mature and it showed a good fishing ground. The sea cucumber is dominated by *Holothurian graffei* as showed in the above picture. Other invertebrates found were sea stars. Mortality of corals showed algae over growing and dominating Heliopora and Pocillopora corals.

- Back reef habitat

Figure 2:- Back reef habitat showing its coral cover

The back reef habitat showed the dominant of dead corals which are becoming ideal substrate for new colony of polyps to settle and grow. The coral diversity is lower than the outer reef comprising of Porite and Platygyra coral genera, which are found dominating. Simultaneously, the fish diversity is low consisting of snappers and surgeonfish which are in juveniles stages indicating a nursery ground for reef fishes. This habitat provided a substrate for clams (*Tridacna maxima*) which its abundance is very high in Abatiku site while in Bike site their abundance is very low. Algal in the forms of turf filament is found dominating the rock substrate and found over-growing on living stressed corals causing high mortality of corals in this habitat

- Lagoon habitat

Figure 3:- Lagoon habitat with its coral cover

The lagoon in Bike site showed a remarkable site for recreational activities. The habitat hosted the abundance of giant massive corals as showed in the above pictures. These giant corals are Porites with their estimated ages of more than a 100 years. The diversity of fish is relatively high but less than the outer reef habitat. There were some stressed corals found as showed by the whitish coral above, indicating a small scale of coral breaching. Moreover, this habitat is illustrated an ideal site for Marine Protected Area, due to the presence of huge corals with old ages which required special conservation.

Endangered Species

From our study we found that *Tridacna gigas* (Te Kima) has critically over fished. There is only one *Tridacna gigas* found in Abatiku back reef habitat. Interviewing one of the Councillor from Abatiku, and he stated that Te Kima is now very difficult to see in their most abundant habitat nowadays. This indicated that Te Kima has been seriously over fished putting it critically to a

level of extinct in Abemama. Thus banning of Te Kima fishing and a legal support from the Bye law is highly recommended.

Potential recreational Site

Figure 4:- Potential sites for snorkelling showing good complexities of corals

Recreational site survey was determined by the complexities and healthy of the corals. The potential sites were found in the lagoon closer to Bike islet whereas giant massive coral of more than a 100 years was abundant providing a complexity and ideal area for snorkelling. The second site showed microatolls or reef patches which hosted staghorn corals (Acropora coral) providing a good complexity of the reef.

Another potential site is the discovery of the great cave in Abemama lagoon. There were stories behind this cave saying that the cave end leads to Aranuka Island. Another stories said that people who are lost their lives at sea usually they return to that cave. The coordinate of this mysterious cave is N 00. 37913° and E 173. 84496°.

However, our team managed to dive into the deep cave. We discovered that the depth is 70 meters whereas the bottom substrate is made of silt and mud. The diameter of the cave is 8 to 10 meters and it is very dark from the inside. Such cave is a potential site for scuba dive to tourists which can play significant role in Abemama economic development

Figure 4: The photos showed the inside of the deep cave which was very dark. The last photo showed the end of the cave with silt and muddy substrate.

Ciguatera sampling

Abemama is considered as one of the Kiribati Island reported to have ciguatera or fish poisoning for mainly reef fishes. The reported site is Tabiang village, whereas the snappers, groupers, moral eel have been reported to cause ciguatera to many people in Tabiang.

The sampling of Halimeda algae was done around Tabiang village in the outer reef which is considered as ciguatera fish poisoning is frequently occurred. Other sampling sites were carried out in the outer reef of Bike and Abatiku and including the lagoon.

Figure 4: The reported site of ciguatera in Tabiang village which is one of our sampling sites

• **Budget spent:**

Actual expenditure Abemama	QTY	No. of days	Rate	Total
Air fare	5	2	\$ 73.00	\$730.00
DSA	5	17	\$ 70.00	\$5950.00
Airport tax	5	1	\$ 20.00	\$ 100.00

Motorbike	1	16	\$ 20.00	\$320.00
Truck	1	3	\$ 50.00	\$150.00
Fuel (Compressor and Bike)	42	1	\$1.20	\$50.40
Boat hire (Fuel & Oil and motorman)	1	12	\$180.00	\$2160.00
Total				\$9460.40