



## 1. SEA CUCUMBER ACTIVITIES

### 1.1 FARM ACTIVITY

Monitoring activities and distribution is ongoing to SMA Communities which is carried out by the Aquaculture team together with the SMA management committees. Activities such as maintenance include checking of the pen cages for damages or any repairing needed which is very important for maintaining of the farm. The aquaculture section also assists the community farms through distributing more juvenile to extended farms and providing materials for repairing of the farm cages. Results from maintenance and monitoring contributes to decision making of the Ministry with regards to the number of sea cucumber juveniles distributed and also looking at way-forward for each SMA farms



Sea cucumber juveniles at Sopu mariculture being prepared for distribution



Makave SMA Community Sea cucumber farm

SMA Community	Sea cucumber juvenile
<b>Makave</b>	2000pcs
<b>Talafo'ou</b>	1600pcs
<b>Talihau</b>	100pcs

*Distribution of sea cucumber juveniles to SMA communities*

Talihau community located in Vava'u is one of the new growing communities that will trial sea cucumber farming in their SMA. A 100 pcs of juveniles transferred to their SMA for trial. Sea cucumbers in Makave SMA are about 8 months since its first release into the farm with an average 600 – 800grams in weight.

### 1.2 MONITORING ACTIVITY

Ongoing monitor of juvenile sea cucumbers is carried out by the aquaculture section at the Sopa Mariculture. Part of the collaboration between the Ministry of Fisheries and the Vast Ocean Sea cucumber ranch is that the VO will continue to provide the Sopa Mariculture with more juvenile sea cucumbers, the Ministry will then be responsible for rearing and looking after them until they are distributed to the SMA farms. Similar throughout the monitoring process, including bi-monthly measuring of length and weighing for tracking growth rate.



Raceway tanks at the Sopa Mariculture where juvenile sea cucumbers are reared and monitored accordingly

### 1.3 HARVEST & PROCESS FROM FARM

Ongoing collaboration with Vast Ocean includes providing assistance during harvest and processing





of sea cucumber from farms in preparation for exportation. The Vast Ocean continues to successfully export sea cucumbers from their farms indicating successfully culturing of sea cucumber farms and a rightful expectation of restocking back wild stock into the ocean. Records and numbers from harvest and process shown below:

Harvesting Data		
Date	Location	Quantities
19-Dec-23	VO Aqua Area	2021
20-Dec-23	VO Aqua Area	1379
<b>Total Harvest</b>		<b>3400</b>

Processing Data			
Date	Pcs	Wet body (kg)	Gutted (kg)
19-Dec-23	2021	696.4	407.8
20-Dec-23	1379	425.8	237.6
<b>Total</b>	<b>3400</b>	<b>1122.2</b>	<b>645.4</b>



Processing activities carried out at Vast Ocean



## 2. PEARL FARM ACTIVITIES

### 2.1 MONITORING & MAINTENANCE

Continuous monitoring of the Ministry Pearl line is carried out by the aquaculture team for both Vava'u and Tongatapu as well as stock taking, to monitor the availability of spats whether a distribution is required and when to carry out.

MoF (Sopu New)			
Device	No. device	No. Oysters/device	Total
Blue Panel Net	7	21	139
Panel Net (Long)	4	21	84
Panel Net (Short)	5	15	78
Aqua Purse	4	20	80
Broodstock	5	6	30

It is also important that the pearl lines are maintained and cleaned every once or twice a month to keep the oysters clean and for the longevity of the farm. The aquaculture team is responsible for the maintenance of the Ministry's pearl lines while the farmers are encouraged by the staff to look after their lines efficiently and record accordingly. Maintenance activities include fixing longlines, cleaning oysters and changing storage unit to more suitable units such as panel nets, aquapurses and hanging oysters to ropes.



Staff cleaning Ministry pearl line at Pangaimotu



The Vava'u team also provided assistance on seeding oysters for farmers who are still requesting the support from the Ministry





### 2.2 PEARL OYSTER SPAWNING

The aquaculture team went out and managed to collect broodstocks in preparation for spawning activities. Thermal shock process began early morning on the 23<sup>rd</sup> of Nov for spawn inducing. However, successful spawn inducing did not occur until the next day 24<sup>th</sup> Nov at 133 – 1400. Sperms & eggs were transferred to buckets and then to large plastic bins to start fertilization. Fertilization process requires a minimum of 1 hour to complete and reach stage D. When the process is complete, the larvae were then transferred to the larval tanks for rearing. Approximately a total 30 million larvae were initially transferred to the larval tanks (6) at day 1 of spawning.

tank, feeding larvae and carefully transferring amongst each tank to track density and size range. Other factors are also notified and recorded for observation such as larval tank temperature and salinity to make sure they are growing in a suitable environment.



Fertilization process

Monitoring is ongoing for a period of at least 2 months depending on the growth rate of the larvae. All monitoring activities include; seawater exchange every other day, counting of larvae every day to estimate the numbers of larvae in each



Monitoring activities

This is ongoing until the larvae are observed to be bigger in size and settle at the bottom of the tanks. They indicate that they are ready to attach and settle onto a surface. Spat collectors are then put into the larval tanks for the larvae to settle onto them. They are then monitored; overflow and fed for at least 3 – 4 weeks before transferring them out to ocean nursery.



Monitoring settlement tanks





### 2.3 SPAT COLLECTOR

Spat collector program continues to be a success in Vava'u with ongoing deployment of more spat collectors, management and monitoring carried out by both the Vava'u staff and the pearl farmers. A total of 12 spat collectors deployed in Vava'u and well monitored.

Collector	Experiment
8 collectors	Fisheries pearl line.
1 collector	Piula pearl farmer
3 collectors	Atonio pearl farmer
1 collector	Estimoa pearl farmer
<b>13 collectors</b>	<b>Total</b>

*Spat collectors deployed in Vava'u*



Spat collector monitoring and harvesting

The spats are harvested from the collectors and transferred to pearl longlines when they reach a certain size. An estimation of juvenile spats harvested from one spat collector is around 100 – 150 oyster spats. The purpose and intention of the spat collector program remains the same as an alternative for pearl farmers to access supplies of spats collected from the wild rather than solely relying on the Ministry's hatchery for spats. Farmers are encouraged by the Ministry to deploy their spat collector lines with the assistance of the team for a more sustainable pearl farming.

### 3. GIANT CLAM ACTIVITIES

#### 3.1 MONITORING JUVENILE CLAM

The aquaculture team continues monitoring activities of the 9 months old juvenile clams at the Sopa mariculture raceway tanks. Activities include cleaning tanks and transferring the juveniles to more additional tanks for stock density. The team managed to harvest and count raceway tanks as they have reached a certain size. Tank #1 had approximately 5,522 juveniles while tank #2 had approximately 12,583 juveniles with an estimation overall of 30,000 juvenile clams including the rest of the raceway tanks.



Cleaning and counting of juvenile clams in raceway tanks



The team will continue to monitor the juvenile clams and count the rest of the tanks accordingly until they reach the size of planting to cement trays and transferring to ocean nursery.





### 3.2 GIANT CLAM FARM

Monitoring of giant clam broodstock is also ongoing for both the SMA farm in Tongatapu at the Fangatapu SMA and Vava’u at the ‘Utulei SMA. Tables below show the remaining numbers of broodstock and giant clam of various sizes that still thrives in each SMA.

Giant Clams Species	Numbers
<i>T. maxima</i> (kukukuku)	5
<i>T. squamosa</i> (matahele)	34
<i>T. derasa</i> (tokanoa)	29
<b>Total</b>	<b>68</b>

Total number of giant clams broodstock at Fangatapu SMA



These images show the current state of the giant clams at Fangatapu SAM during monitoring



Giant clam farming at the ‘Utulei SMA in Vava’u is still thriving with the staff continuing to monitor and clean together with the community. It is vital to maintain the record of these farms to track the mortality rate of the clams in the farms and their growth rates.

Giant clams Species	Numbers	Size range
<i>T. derasa</i> (tokanoa)	87	15-21cm
<i>T. maxima</i> (kukukuku)	106	6-8cm
<b>Total</b>	<b>193</b>	

Total number of giant clams at the ‘Utulei SMA farm during monitor

### 4. OTHER ACTIVITIES

The aquaculture section continues to promote and raise awareness of the sector through hosting of school field trips. Majority of schools are primary and pre-schools. The children are first showcased presentations by staff that include target & potential species that are cultured at the mariculture, before tours around the Mariculture.

Staff help explain during the trips all the work that is being done at the mariculture and their importance to the community and the environment. Young children are exposed at an early age the importance of the work carried out and its great contribution to their communities and livelihood for families.



Field trips from pre-school with staff member presentation

