

# THE GIANT CLAM PROJECT



**AQUACULTURE/MARICULTURE  
BRANCH "PMDC"**

**Bureau of Marine Resources**



## **PRESIDENT POLICY and OBJECTIVE of the GIANT CLAM PROJECT**

**Because of the diminishing natural stocks of giant clams, the President of the Republic of Palau, Tommy E. Remengesau Jr. stated in his Presidential Address of year 2001 that in year 2008, a total of 2 million giant clams must be planted in the waters around Palau.**

**The objective of this project is to expand the communities ocean based clam nurseries to :**

- establish a giant clam breeding stock to enhance natural stocks of giant clams in nearby reefs utilized in communities subsistence fishery;**
- initiate a small cottage income generating industry for communities based on clam meat, shells and live clams;**
- and promote management of fishery stocks through conservation.**

**The project will benefit all communities involved in terms of improved nutrition, improved fisheries, additional income, establishment of an on-going income generating industry, and giant clam stock conservation. In addition, neighboring communities, through natural spreading of giant clam larvae by ocean current, will benefit by the enhancement of the giant clam resources on their reefs.**



## GIANT CLAM CULTURE, CONSERVATION & FARMING MANAGEMENT WORKSHOP



PMDC & DED with assistance from MCPA-BMR conducted a 1-week workshop on Giant Clam Culture, Conservation and Ocean-Based Nursery Management.

The transfer of technology to state level insure maximum production yield and help expedite project activities to reach our expected goal.



# GIANT CLAM FARMS & MANAGEMENT

Number of established giant clam farms to date are 29 located in 12 States namely Kayangel, Ngarchelong, Ngaraard, Ngardmau, Ngatpang, Melekeok, Ngiwal, Ngchesar, Aimeliik, Koror, Peleliu and Helen Reef-Hatohobei.

As of July 2005, these farms have been stocked with 1,003,373 seeds ranging from 2cm to 5cm (1-2.5 inches). Arrangements are made through the States offices and Aquaculture/Mariculture Branch (PMDC) of Bureau of Marine Resources of the National Government, in which States government make formal request for Aquaculture/Mariculture Branch (PMDC) to establish the farms.

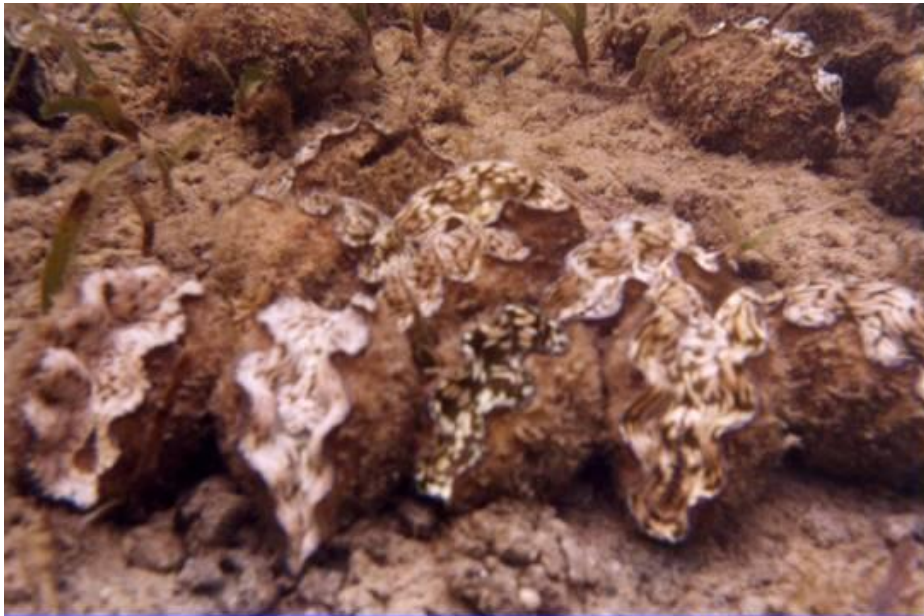
To date, the State's government and/or private owners, PMDC-BMR and other assisting agency (Commerce & Trade) bore the cost of materials. PMDC-BMR provides expertise and monitor/surveys on conditions and survival for statistical purpose and free seeds/animals. Security monitoring is conducted by the states/owners.

# GIANT CLAM FARMS & MANAGEMENT TABLE

| ID | STATE       | FARMER                           | % SURVIVAL     | # SURVIVAL | AVE SIZE       | RANGE SIZE     | DATES      | COMMENTS                        |
|----|-------------|----------------------------------|----------------|------------|----------------|----------------|------------|---------------------------------|
| 1  | NGIWAL      | TITUSINACIO                      | 89%            | 12,282.00  | 16 cm or 6.2"  | 14.5 - 20.2 cm | 4/13-21/05 |                                 |
| 2  | NGIWAL      | RUSSEL MASAYOS                   | 92%            | 19,872.00  | 8 cm or 2.3"   | 4.6 - 7.0 cm   | "          |                                 |
| 3  | MELEKEOK    | REMERIANG TELL                   | 88%            | 39,600.00  | 14 cm or 5.6"  | 10.4 - 15.9 cm | "          |                                 |
| 4  | MELEKOK     | EDLEE & BERNICE                  | 100% mortality |            |                |                | "          | POOR MANAGEMENT                 |
| 5  | NGCHESAR    | STATE                            | 53%            | 23,850.00  | 18 cm or 6.7"  | 14.3 - 19.9 cm | "          | POOR MANAGEMENT                 |
| 6  | KOROR       | HARVEY SISIOR                    | 97%            | 15,714.00  | 10 cm or 3.13" | 6.8 - 11.3 cm  | "          | GOOD MANAGEMENT                 |
| 7  | KOROR       | TIULL                            | 92%            | 16,617.00  | 12 cm or 4.11" | 7.5 - 15.2 cm  | "          |                                 |
| 8  | KOROR       | NGERKEBESANG                     | 98%            | 1,012.00   | 18 cm or 6.14" | 13.2 - 21.0 cm | "          |                                 |
| 9  | KOROR       | NGEBEKUU                         | 92%            | 29,061.00  | 15 cm or 5.15" | 11.4 - 19.0 cm | "          |                                 |
| 10 | KOROR       | BOBBY SUKRAD                     | 50%            | 25,100.00  | 8 cm or 2.15"  | 5.3 - 9.2 cm   | "          | POOR MANAGEMENT                 |
| 11 | KOROR       | CENTRAL NURSERY(DED)             | 3%             | 2,264.00   | 12 cm or 4.7"  | 7.4 - 15.6 cm  | "          | POOR MANAGEMENT                 |
| 12 | NGARAARD    | KUABES (ALBERT SHIRO)            | 51%            | 36,720.00  | 17.0 cm        | 14.5 - 19.4 cm | "          | POOR MANAGEMENT                 |
| 13 | NGARAARD    | WILEIN BOLWAISEI                 | 98%            | 18,553.00  | 10.3 cm        | 2.01 - 18.6 cm | "          |                                 |
| 14 | NGARDMAU    | AL SON NGIRAIWET                 | 100% mortality |            |                |                | "          | POOR MANAGEMENT                 |
| 15 | NGARDMAU    | ROADRUNNER (CYRUS)               | 56%            | 26,040.00  | 15 cm          | 13.3 - 16.0 cm | "          | POOR MANAGEMENT                 |
| 16 | NGARCHELONG | COOP                             | 3%             | 2,284.00   | 15.1 cm        | 11.0 - 17.0 cm | "          | POOR MANAGEMENT                 |
| 17 | NGARCHELONG | BAUDISTA SATO                    | 92%            | 24,472.00  | 8.6 cm         | 6.0 - 10.1 cm  | "          |                                 |
| 18 | NGARCHELONG | SIOBERT SKANG                    | 100% mortality |            |                |                | "          | DESTROYED BY STRONG WAVE        |
| 19 | NGARCHELONG | JORDAN                           | 100% mortality |            |                |                | "          | ACTION DESTROYED BY STRONG WAVE |
| 20 | NGARCHELONG | NGIRI JONGGUKI<br>RULUKED SEKODL | 100% mortality |            |                |                | "          | ACTION DESTROYED BY STRONG WAVE |
| 21 | AIMELIK     | MCVEY & BERNICE                  | 56%            | 27,496.00  | 7.0 cm         | 4.6 - 10.7 cm  | "          | ACTION POOR MANAGEMENT          |
| 22 | NGATPANG    | NGIRAKESOL MAIDESIL              | 46%            | 44,482.00  | 16.0 cm        | 12.0 - 18.7 cm | "          | POOR MANAGEMENT                 |
| 23 | NGATPANG    | HIROMI NABEYAMA                  | 44%            | 20,108.00  | 10.0 cm        | 7.2 - 12.3 cm  | "          | POOR MANAGEMENT                 |
| 24 | KAYANGEL    | STATE                            |                | 129.00     |                |                | 5-12-05    | MONITORED BY BANDARII *         |
| 25 | KAYANGEL    | THOMAS OBAK                      |                | 69.00      |                |                | "          | TRANSFERRED BY STATE            |
| 26 | KAYANGEL    | JOHN SON BANDARII                |                | 58.00      |                |                | "          | TRANSFERRED BY STATE            |
| 27 | KAYANGEL    | STEVENSON M.                     |                | 62.00      |                |                | "          | "                               |
| 28 | KAYANGEL    | INAO S.                          |                | 60.00      |                |                | "          | "                               |
| 29 | KAYANGEL    | REMOKET M.                       |                | 29.00      |                |                | "          | "                               |
| 30 | KAYANGEL    | OBEKETANG R.                     |                | 90.00      |                |                | "          | "                               |
| 31 | KAYANGEL    | ALFRED R.                        |                | 33.00      |                |                | "          | "                               |

The background is a solid blue gradient. A thin, light blue curved line starts from the top left and arcs towards the right side of the slide. On the right side, there is a darker blue triangular shape pointing towards the center.

# **GIANT CLAM FARMS MONITORING ON GROWTH AND SURVIVAL MANAGEMENT**



**NGARCHELONG COOP**

**PLANTED—FEB. 13, 2002**

**SPECIES: KISM = 76,150**

**MONITORED—APR. 2005**

**SURVIVAL RATE = 3% / 2,284**

**AVERAGE SIZE = 15.1 CM or 6.4 IN**



**NGARCHELONG—BAUDISTA SATO**

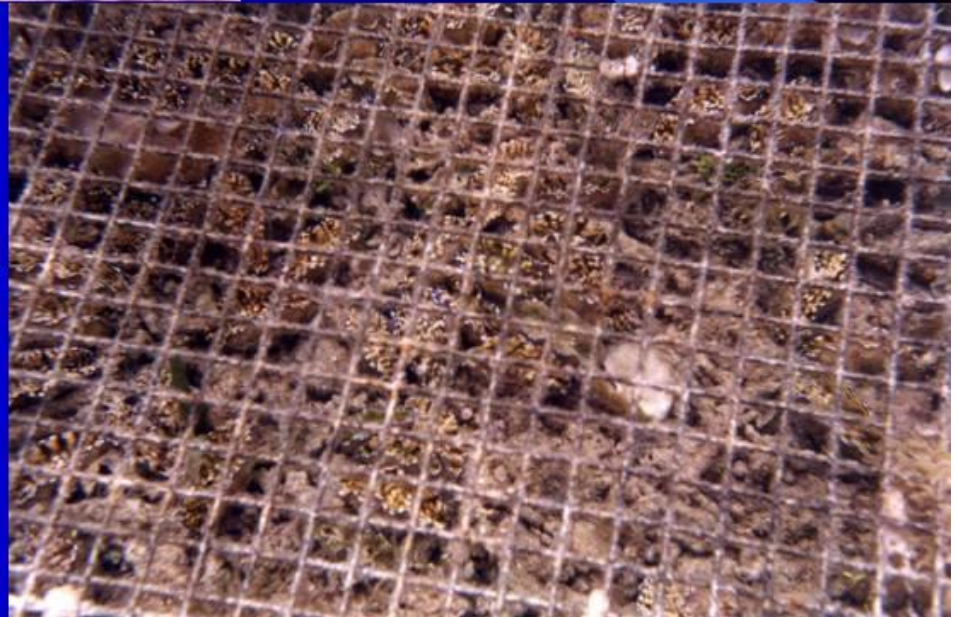
**PLANTED—SEPT. 30, 2004**

**SPECIES: KISM = 26,600**

**MONITORED—APR. 2005**

**SURVIVAL RATE = 92% / 24,472**

**AVERAGE SIZE = 8.6 CM or 3.44 IN.**



**NGATPANG STATE (MAIDESIL)**

**PLANTED—FEB. 18, 2000**

**SPECIES: KISM =96,700**



NGATPANG STATE-MAIDESIL FARM 2

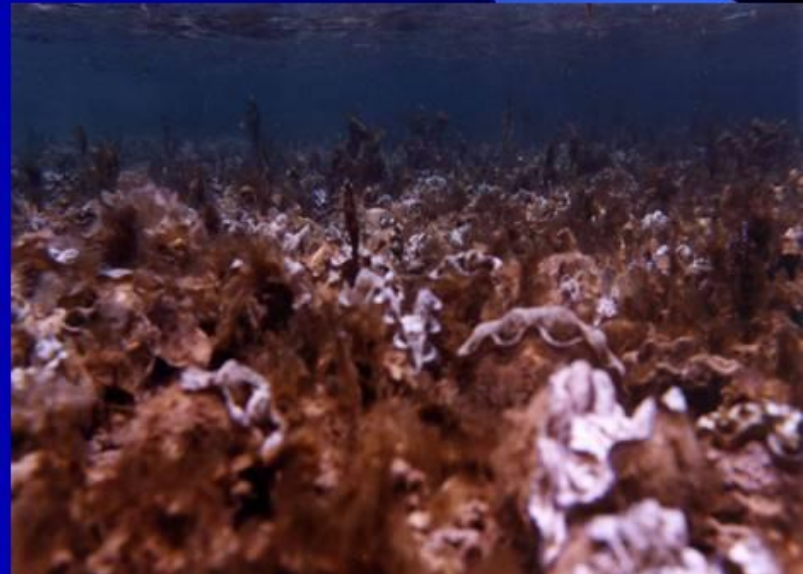
**MONITORED—APR. 2005**

**SURVIVAL RATE: 46% / 44,482**

**AVERAGE SIZE: 16.0 CM or 6.4 IN.**



NGATPANG STATE-MAIDESIL CLAM FARM 1





**NGATPANG STATE—RUBEANG HIROMI NABEYAMA**

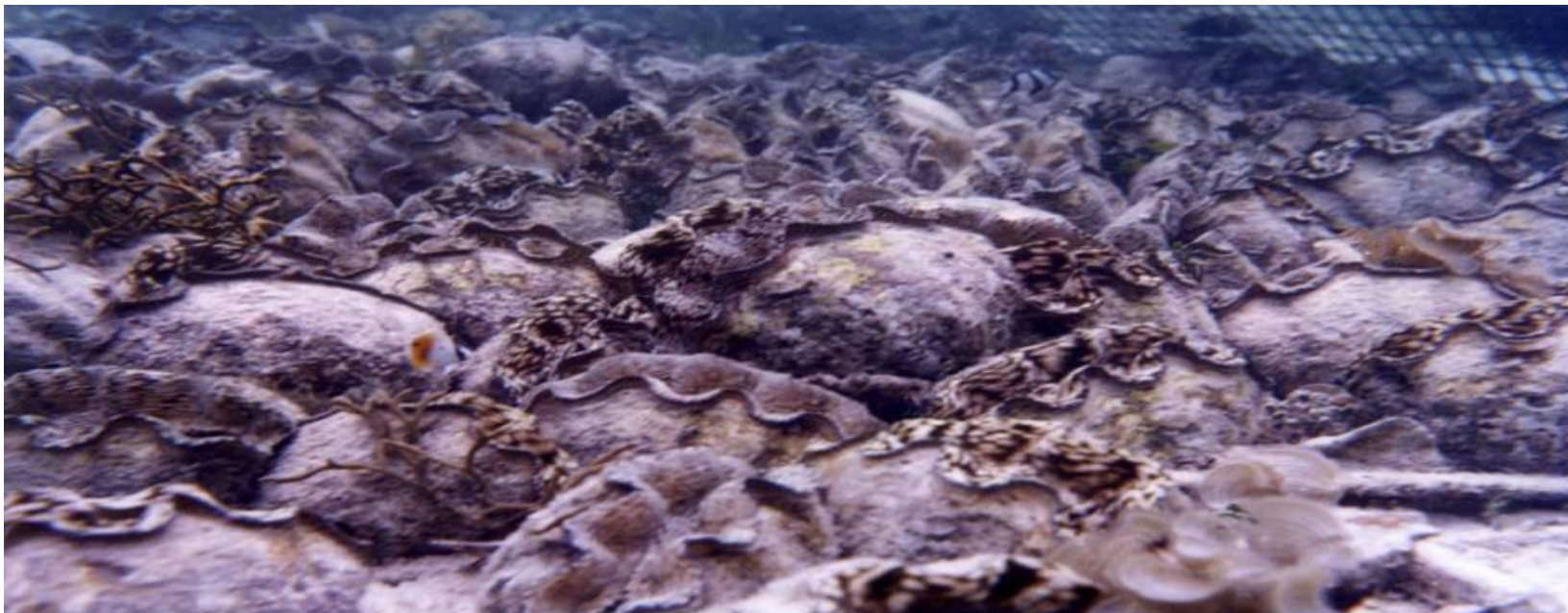
**PLANTED DATE: JAN. 29, 2003**

**SPECIES: KISM = 45,700**

**MONITORED ON APRIL 2005**

**SURVIVAL RATE: 44%                      = 20,108 ANIMALS**

**AVERAGE SIZE: 10 cm or 4 in**



**NGIWAL STATE**

**PLANTED: AUG. 27, 2002**

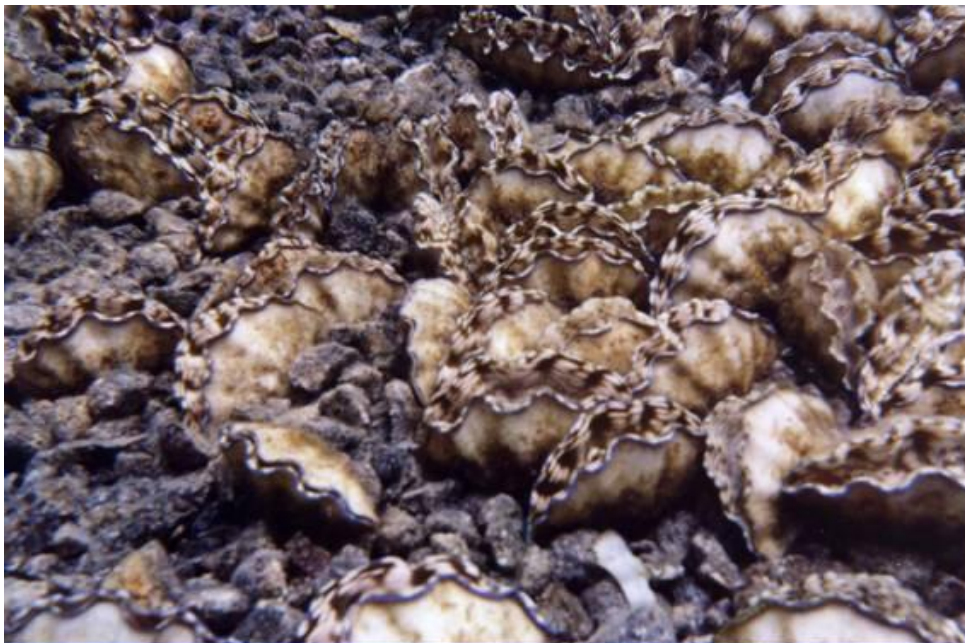
**SPECIES: KISM =13,800**

**MONITORED ON APRIL 2005**

**SURVIVAL RATE: 89% / 12,282  
ANIMALS**

**AVERAGE SIZE: 16 cm or 6.4 in**

**NOTE:** Farm was divided and assigned to three locals for the better management. Transferred by Governor Elmis Mesubed in year 2005.



**NGIWAL STATE –RUSSEL MASAYOS**

**PLANTED: DEC. 03, 2004**

**SPECIES: KISM =42,000**

**MONITORED ON APRIL 2005**

**SURVIVAL RATE: 92% =19,872**

**AVERAGE SIZE: 8 cm or 3.2 in**





**MELEKEOK STATE –REMERIANG TELL**

**PLANTED: OCT. 19, 2003**

**SPECIES: KISM =45,000**

**MONITORED ON APRIL 2005**

**SURVIVAL RATE: 88% / 39,600**

**AVERAGE SIZE: 14 cm or 5.6 in**



**NGCHESAR STATE**  
**PLANTED: AUG. 21, 2002**  
**SPECIES: KISM =45,400**  
**MONITORED ON APRIL 2005**  
**SURVIVAL RATE: 53%**  
**27,240 # OF ANIMALS**  
**AVERAGE SIZE RANGE:**  
**18 cm or 7.2 in**



**NGARAARD STATE—KUABES CLAM FARM  
(ALBERT SHIRO)**

**PLANTED: MAY 2002**

**SPECIES: KISM =72,000**

**MONITORED ON APRIL 2005**

**SURVIVAL RATE: 51% =36,720 ANIMALS**

**AVERAGE SIZE : 17 cm or 6.8 in**

## MATERIALS NEEDED

| Qty  | Item                               | Unit Price                             | Cost              |
|--|------------------------------------|--|-------------------|
| 30 pcs.  | 1" Rebar                           | 10.00                                  | 300.00            |
| 30 pcs.  | ¼" Rebar                           | 4.00                                   | 120.00            |
| 3 rolls  | 100' Plastic screen                | 99.00                                  | 297               |
| 4 pcs  | Tarp or canvas 24'x34'             | 59.95                                  | 239.00            |
| 1  | Boat-Yamaha 25' w/twin engine      |  |                   |
| 36 gal   | Gasoline(\$3/gal.) TRIP<br>4 TRIPS | 108.00                                 | 432.00            |
| 4 qts  | Oil per trip<br>4 trips @\$12      | 48                                     | 192.00            |
| 50,000   | Clam Seeds<br>3-5 cm @\$4          | 4X (\$200,000.00)                      | 0                 |
| 5  | Personell @\$3.25/hr               | \$16.25*8hrs.= \$130/day<br>*4 (trips) | 520.00            |
| <b>NOTE* From survey to construction to planting</b> |                                    |  |                   |
| <b>TOTAL COST OF ONE FARM</b>                        |                                    |  | <b>\$2,101.00</b> |

- SPAWNERS COLLECTION



- SPAWNERS CONDITION



- SPAWNING



## •EGG COUNTING



## •LARVAL REARING



## •HARVEST



# •PLANTING



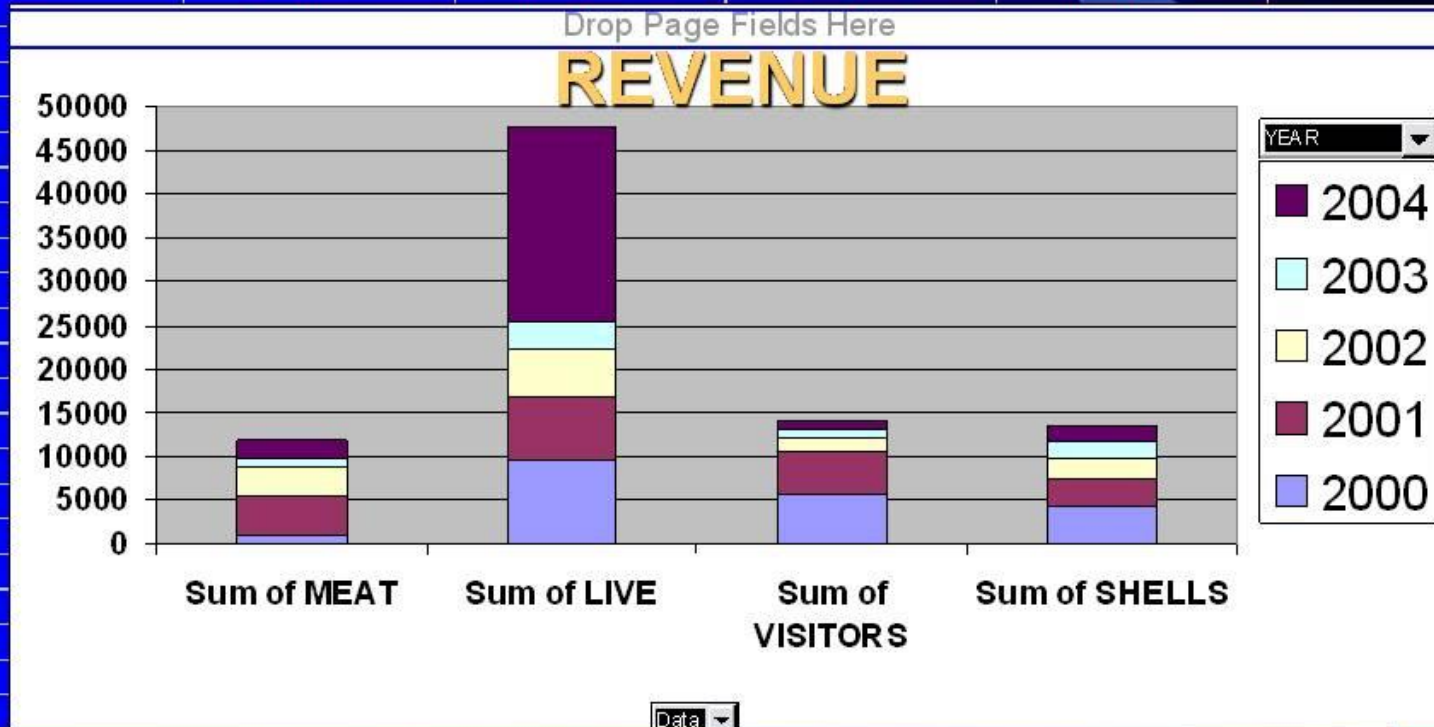
# HATCHERY SEED PRODUCTION CHART

| Sum PRODUCED | SPECIES    |           |           |          |           |             |             |
|--------------|------------|-----------|-----------|----------|-----------|-------------|-------------|
| YEAR         | H.hippopus | T. crocea | T. derasa | T. gigas | T. maxima | T. squamosa | Grand Total |
| 2001         | 134023     |           | 99066     |          |           |             | 233089      |
| 2002         |            |           | 722186    |          |           |             | 722186      |
| 2003         |            |           | 902796    | 24013    |           |             | 926809      |
| 2004         |            | 36012     | 1076444   |          | 48317     | 107149      | 1267922     |
| Grand Total  | 134023     | 36012     | 2800492   | 24013    | 48317     | 107149      | 3150006     |



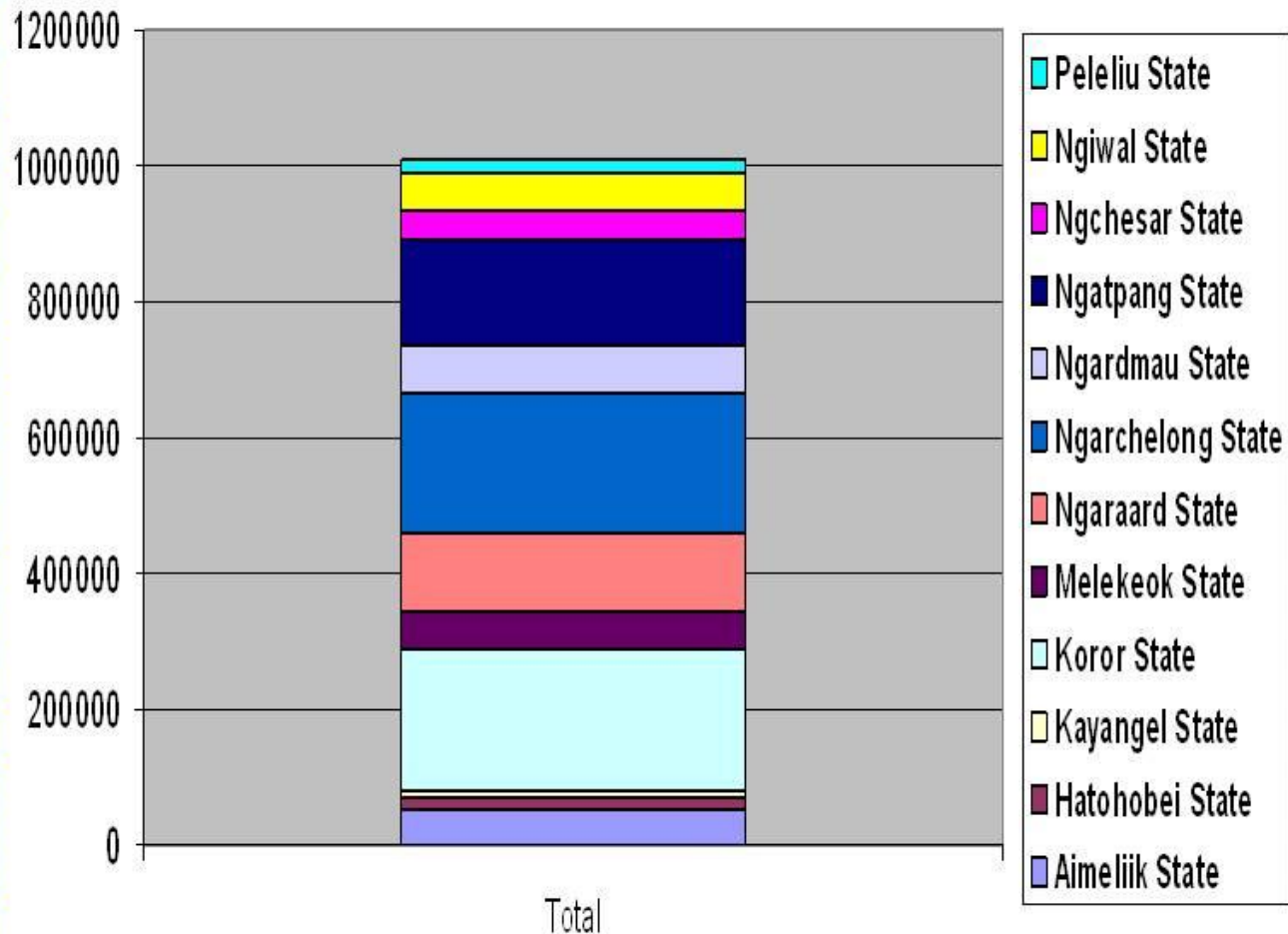
# PMDC ANNUAL REVENUE IN YEAR 00, 01, 02, 03 & UP TO JULY '04

| YEAR         | VISITORS           | SHELLS             | LIVE               | MEAT               | TOTAL              |
|--------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 2000         | \$5,636.00         | \$4,300.15         | \$9,400.00         | \$1,059.00         | \$20,395.15        |
| 2001         | \$4,806.00         | \$3,027.25         | \$7,338.00         | \$4,448.75         | \$19,620.00        |
| 2002         | \$1,648.00         | \$2,361.00         | \$5,610.00         | \$3,335.00         | \$12,954.00        |
| 2003         | \$991.00           | \$1,919.00         | \$2,928.00         | \$985.50           | \$6,823.50         |
| 2004         | \$984.00           | \$1,969.00         | \$22,291.25        | \$2,063.50         | \$27,307.75        |
| <b>TOTAL</b> | <b>\$14,065.00</b> | <b>\$13,576.40</b> | <b>\$47,567.25</b> | <b>\$11,891.75</b> | <b>\$87,100.40</b> |



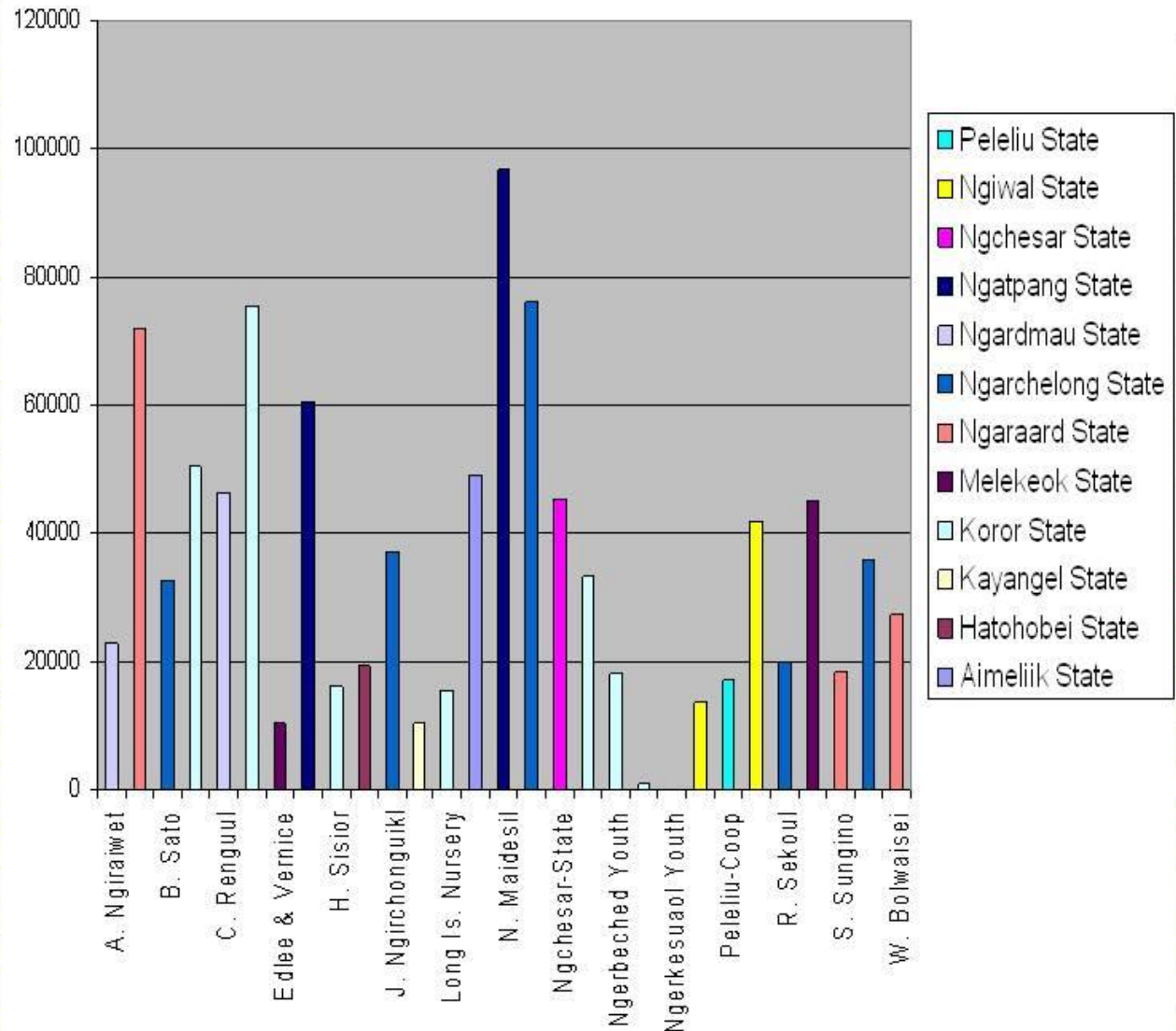
# CHART-SUM OF SEEDS

|                   |         |
|-------------------|---------|
| Aimeliik State    | 49100   |
| Hatohobei State   | 19500   |
| Kayangel State    | 10560   |
| Koror State       | 210313  |
| Melekeok State    | 55600   |
| Ngaraard State    | 117550  |
| Ngarchelong State | 201550  |
| Ngardmau State    | 69500   |
| Ngatpang State    | 157400  |
| Ngchesar State    | 45400   |
| Ngiwal State      | 55800   |
| Peleliu State     | 17100   |
| Grand Total       | 1009373 |

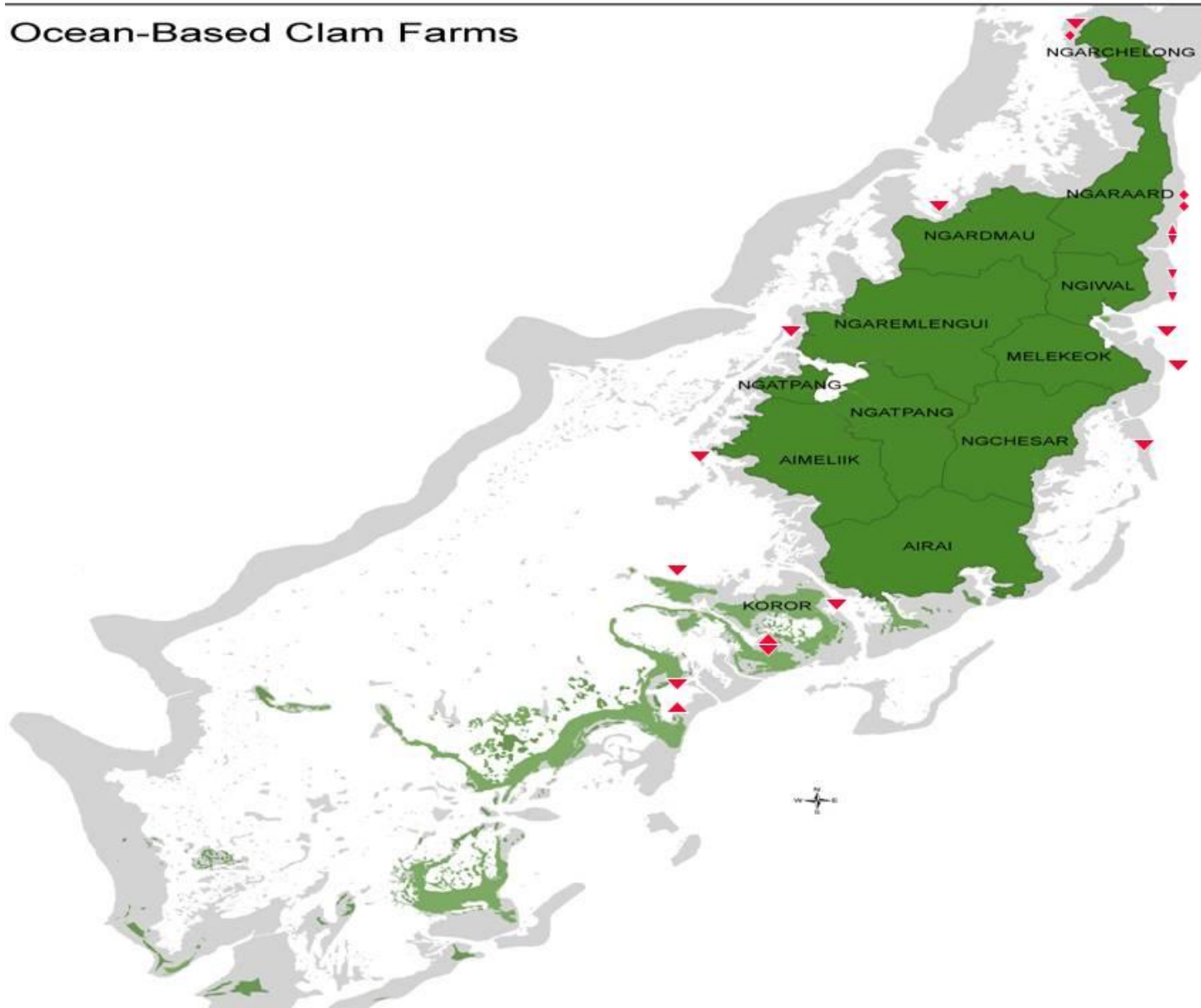


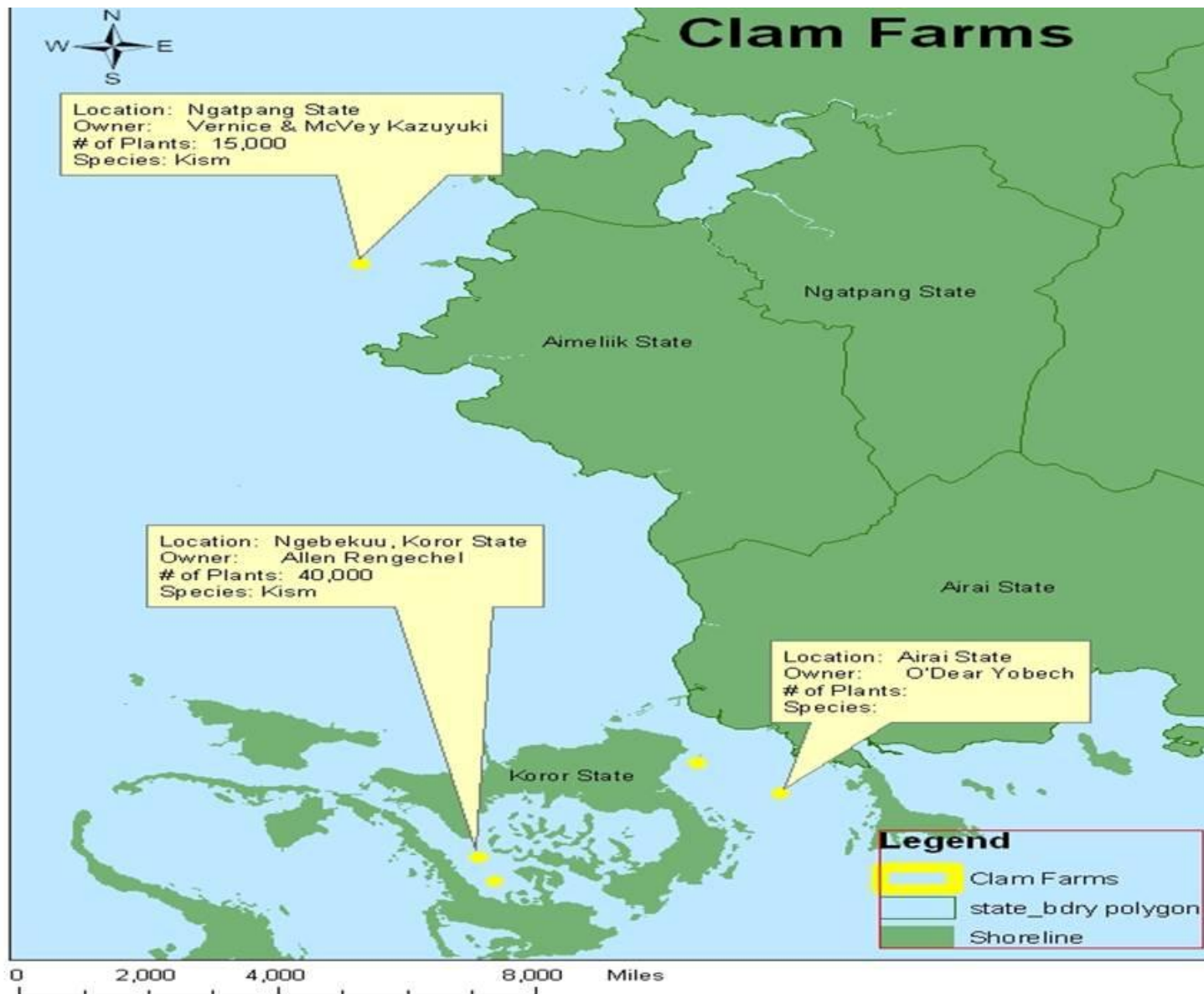
## CHART-FARMERS & SEEDS

|                    |         |
|--------------------|---------|
| A. Ngiraiwet       | 23000   |
| A. Shiro           | 72000   |
| B. Sato            | 32600   |
| B. Sukrad          | 50500   |
| C. Renguul         | 46500   |
| Central Nursery    | 75479   |
| Edlee & Vernice    | 10600   |
| H. Nabeyama        | 60700   |
| H. Sisor           | 16200   |
| Hellen Reef        | 19500   |
| J. Ngirchonguikl   | 37000   |
| Kayangel-Coop      | 10560   |
| Long Is. Nursery   | 15700   |
| McBay & Vernice    | 49100   |
| N. Maidesil        | 96700   |
| Ngarchelong-Coop   | 76150   |
| Ngchesar-State     | 45400   |
| Ngebekuu Farm      | 33339   |
| Ngerbeched Youth   | 18062   |
| Ngerkebesang Youth | 1033    |
| Ngerkesuaol Youth  | 0       |
| Ngiwal-State       | 13800   |
| Peleliu-Coop       | 17100   |
| R. Masayos         | 42000   |
| R. Sekoul          | 20000   |
| R. Tell            | 45000   |
| S. Sungino         | 18300   |
| SFCF (Siobert)     | 35800   |
| W. Bolwaisei       | 27250   |
| Grand Total        | 1009373 |



## Ocean-Based Clam Farms





# CONSTRAINT

- Not enough funding
- Short staff
- Facility is not adequate to accommodate 2-3 million seeds per year
- Marketing of clam products is becoming a big problem
  - written agreement between stakeholders
  - BMR appropriate monitoring personnel (require size for local market or aquarium export, revoking of agreement and penalty)
  - National Government and local State Government support and financial assistance to cultured clam farmers.

# RECOMMENDATION

- **The need for PMDC to continue with ocean-based nursery and expand the program to all 16 states of the Republic of Palau depends entirely on sufficient financial support.**
- **It is envisioned that with enough funding, this program will create an industry that can support local communities and to protect our resources and sustain the natural marine environment for generations to come.**