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Monitoring Results of No Take Zones at Fumba Peninsula



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Cover Photo: Monitoring group at Chaleni
Photo Credit: N.Jiddawi

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1.Introduction

Gleaning the intertidal area is a common job among most women living along the coast in Zanzibar. the bulk of the collection is cockles of *Anadara* sp, *Pinctada*, *Pteria* and other mollusk. Of late the number of people doing this activity has increased as a result of increase in demand as well as the introduction of jewelry making activity and pearl farming which requires some adult stocks. Gleaning usually can take place only during spring tides, so this acts like temporary short closures. In other areas No-take reserves (Fig. 1) for management of bivalves have shown enhanced recruitment in areas adjacent to the reserves as well.

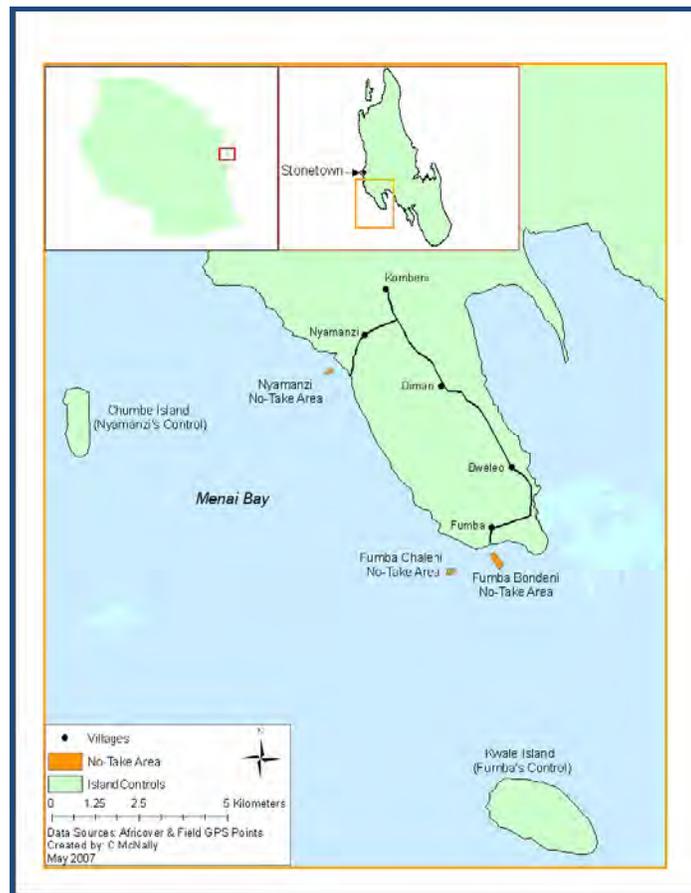


Figure 1: Fumba Peninsula showing the four villages and three of the no take zones.

The reasons for establishing these no take zones was that harvesters reported that sizes were declining and the amount of time needed to collect a can full of cockles took much longer than 5 or 10 years ago, or they have to take boats to small offshore islands in the bay where abundance is much greater in order to collect a similar amount. Since this local knowledge pointed to overfishing problems, the idea of establishment of no-take zones was introduced to the community. After a series of meetings and discussions the communities decided to

establish four no take areas near the villages of Bweleo, Nyamanzi, Fumba Chaleni and Fumba Bondeni (Crawford *et al.*, 2010).

There are by laws to manage the no-take zones which were drafted by the communities and signed by all three village heads and by the District Fisheries Commissioner in 2007 (Ngowo *et al.*, 2007). Also management committees were established in each village with seven members including a chairperson, secretary, and treasurer. The bylaws include punishments for poaching and require demarcation of the sites.

The study was done to look at abundance and size structure of bivalves in reserve sites and their adjacent areas so as to see how the reserves function.

2. Methodology

Community-based monitoring was conducted at each of the no-take areas. The extension team trained the community on data sampling.

A 100 meter transect line was laid on the reef flat parallel to the shoreline and perpendicular to the no-take zone boundary. A one-meter square quadrat was randomly placed along the transect and then at every 10 m interval (10 quadrats per transect). All cockles found in the substrate within the quadrat were counted. As each transect was completed, the line would be moved further from the shoreline and another group of quadrats would be sampled. In each adjacent and no-take site, 100 one-square meter quadrats (10 transects) were sampled .



Figure 2: Monitoring activities at Chaleni (Photo credit – N.Jiddawi)

Once data was collected, simple bar charts of length frequency distribution were prepared by the community after data collection and analysis. with the assistance of the extension team and presented to all community members.

Fumba Peninsula is located on the south west side of Unguja island (6°19'S; 39°17'E), where Pwani project is involved in four villages (Nyamanzi, Bweleo, Fumba Chaleni and Fumba Bondeni).

The no-take area for **Bweleo** is located at 6°19'27"S, 39°17'12.0"E. In this area water always remain during all spring tides.

The no-take area for Fumba **Bondeni** is located at 6°19'20.9"S, 39°17'12.0"E

The Fumba **Chaleni's** no-take area is located at 6°19'32.7"S, 39°17'12.0"E adjacent to fringing reef with an area of 300m². Contrary to other no-take areas, this area is exposed only in high spring tides of NE monsoon winds.

In **Nyamanzi** village the no-take area is located at 6°16'19.7"S, 39°14'41.2"E and having coverage of 200 m². The area is exposed during low tides.. The site experiences very high seasonal change in habitat due to continually shifting sand resulting from monsoon winds.

The size of cockles was measured by using a sorter bin, which was meant for measuring height of cockles and had holes starting from 1 to 12 equivalent to 0.5cm to 6 cm

3. Results

The results presented are a total of all bivalves found for the whole area of 10 transects and 10 quadrats per transect. The highest numbers were found at Bweleo followed by Chaleni. The lowest was at Nyamanzi Fig 3. Comparative abundance is indicated in Fig. 4. This means there is an average of 10 bivalves per quadrat of one meter square in Bweleo No take zone and one at Nyamanzi which was the lowest. Four were found at Bondeni and 7 at Chaleni.

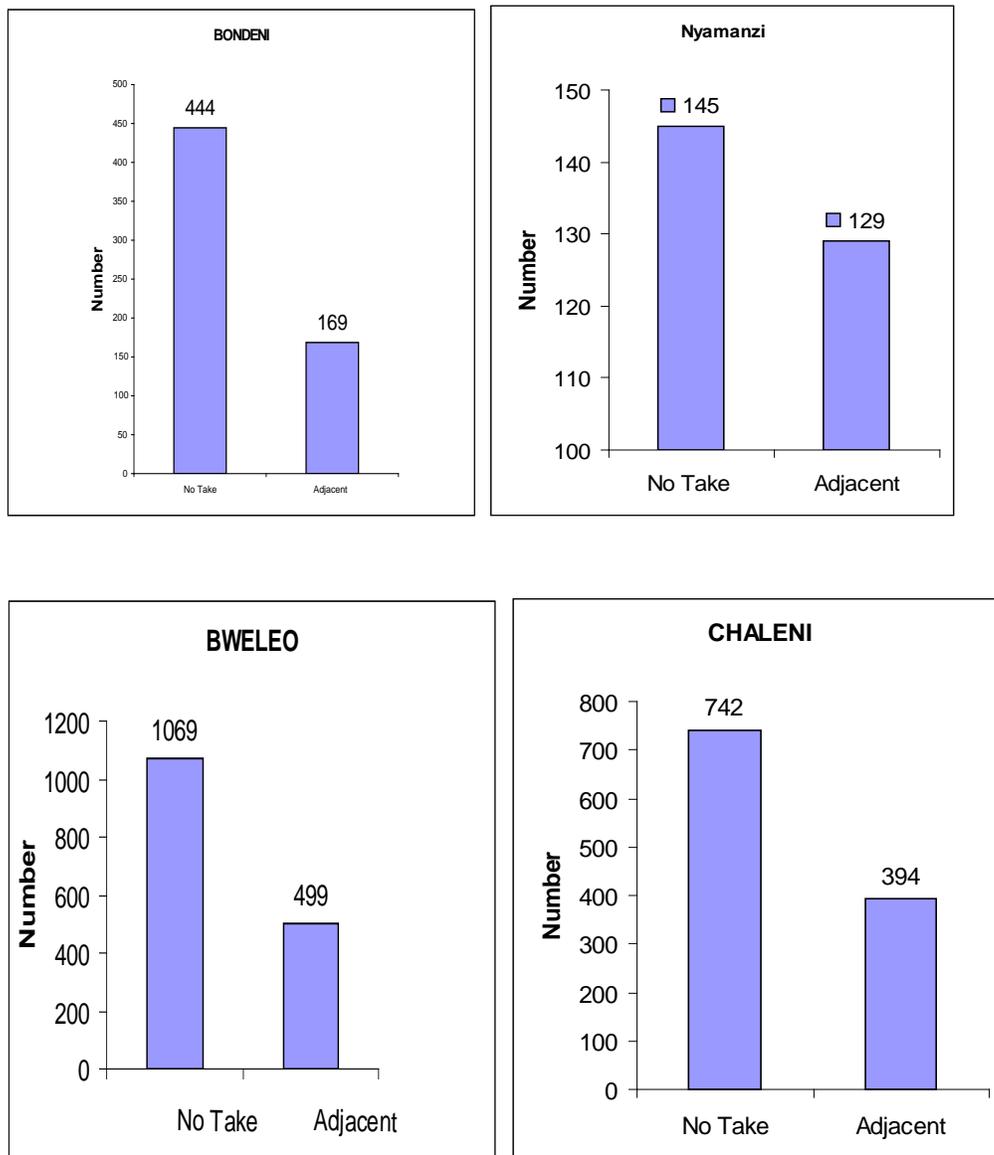


Figure 3: Number of bivalves at Bondeni, Nyamanzi, Bweleo and Chaleni in the 10 transects measured

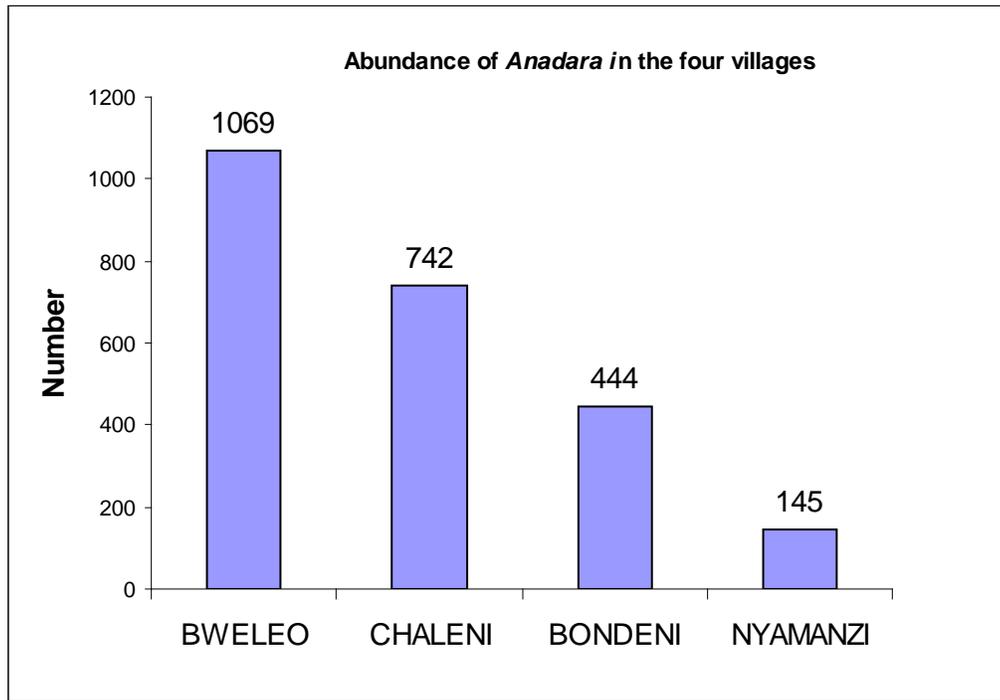


Figure 4: Comparison of cockle abundance at the 4 villages in the 10 transects measured

3.1 Sizes of cockles collected

The sizes (Fig 5 to Fig 8) ranged from 1 equivalent to 0.5 cm up to 12 which is equivalent to 6 cm. More bigger cockles were found at Bweleo followed by Chaleni with sizes of up to 7. At Bondeni the common size was No. 6. Most big sizes were found in the no take zones. In some instances very small cockles of size less than 1cm were found too. These were possibly newly hatched cockles.

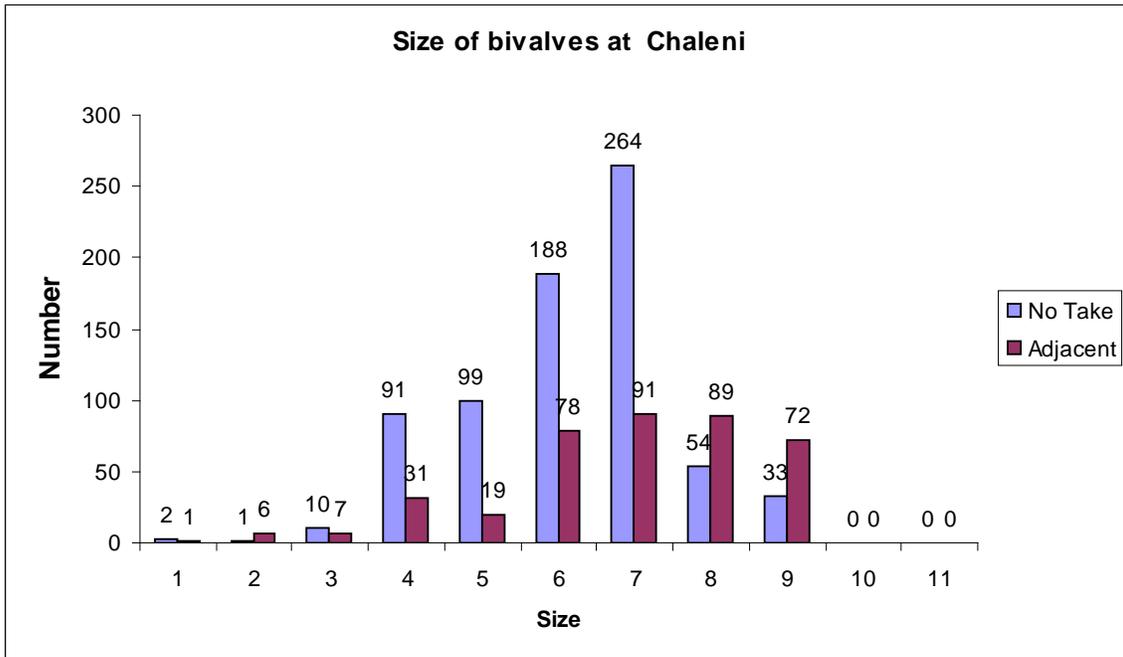


Figure 5: Sizes of Bivalves s at Chaleni

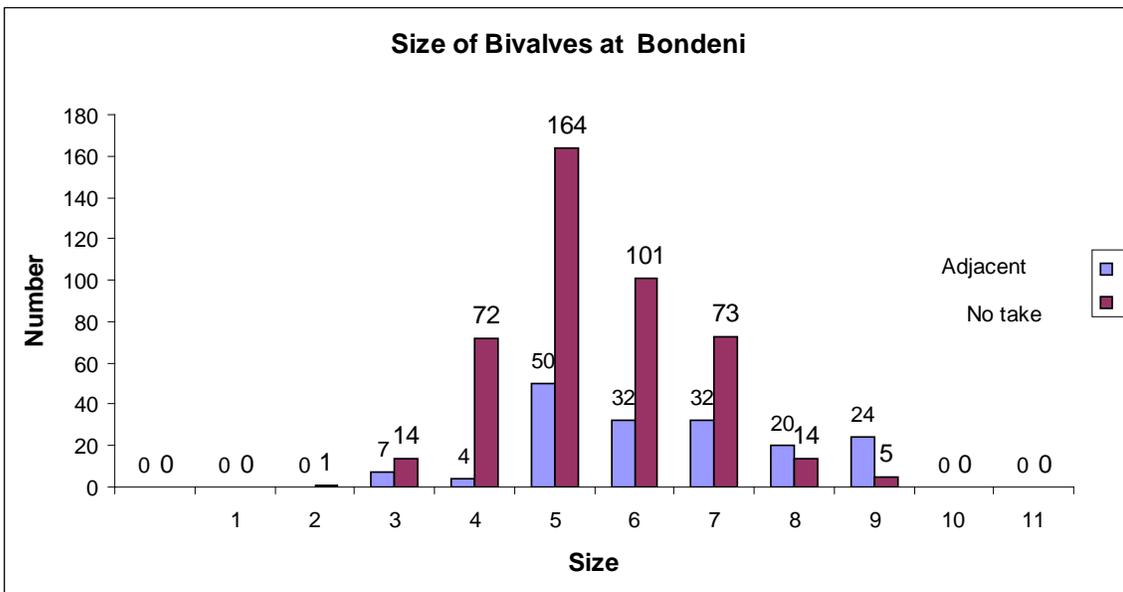


Figure 6: Sizes of Bivalves s at Bondeni

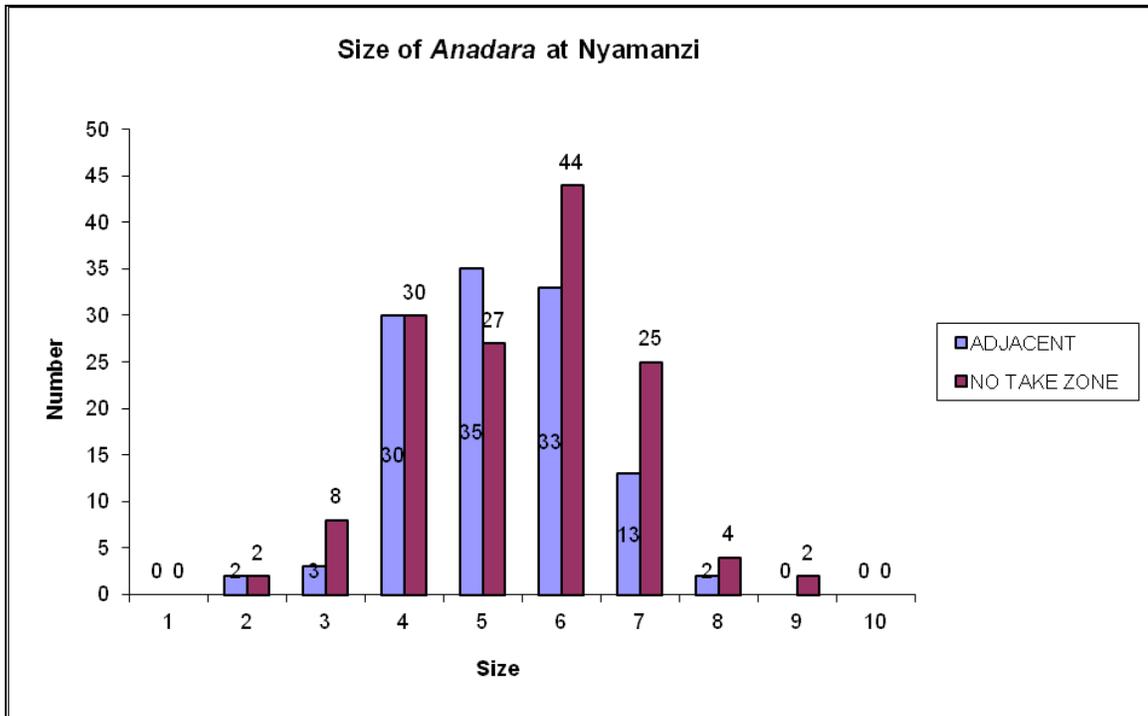


Figure 7: Sizes of Bivalves at Nyamanzi

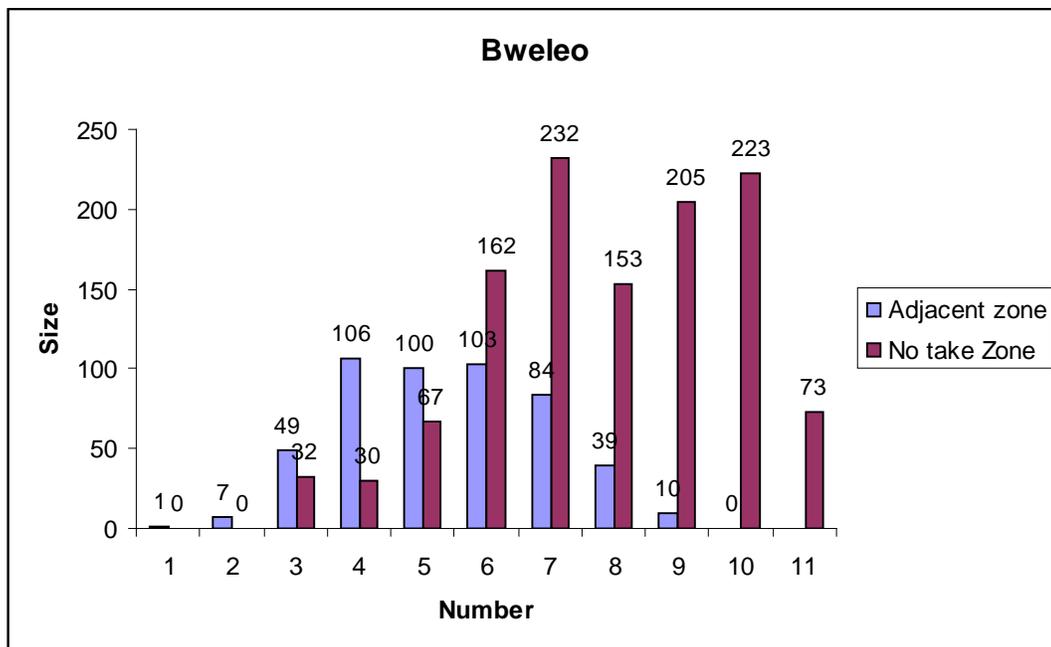


Figure 8: Sizes of Bivalves at Bweleo

3.2 The problems raised during the feed back exercise

At Chaleni people have started to collect cockles in the no take zones especially during festivals as they knew they will get a lot of cockles in a very short period.

At Nyamamzi they claimed the area is filled with sand and this causes mortality of the bivalves. This has been an on going problem and needs to be changed. and at Bondeni they blamed the community of Bweleo for coming to poach.

At. Bweleo they had no problem as their site is in front of KMKM (Local Navy) and people are scared to go and poach. Also most of the time it is filled with water so collection among woman who form a majority of the collectors can not access the area.

All villages have suggested to revise the no take committees and establish new ones as some of the old committee members are no longer interested.

The overall results indicate that there are more bivalves in No Take reserves than in adjacent zones. Also at Bweleo the number seem greater than when it started. The most important is that the community members are still interested in maintaining the no take zones as despite all problems they have noticed a positive change.

4. Comparison of the old data from monitoring results in the four villages 2006 to 2011

4.1 Expected Results

This is shown in Fig 9 a to 12.

- Wanted to see increased density each year in both inside no-take and adjacent areas. It was expected that over time No-Take abundance should be greater than adjacent areas (reserve effect) and also No-take should increase faster than adjacent areas

The results indicated the following:

In No-Take Zone

- There was an increase in cockle abundance in both Bweleo and Bondeni. The increase in Chaleni was not satisfactory and there was a decrease in Nyamanzi compared to 2006 when the fist monitoring started. Also the sizes of cockles in the no take zones in most areas are larger compared to the adjacent zones.

- **Possible Reasons**

No poaching, In Bweleo accessibility to the area to those who are among the biggest collectors (women) is small and also people were adhering to the no take rules. In other sites there was some poaching and at Nyamanzi the site was filled with sand during some months thereby increasing mortality of the cockles.

In Adjacent Area

- There was also an increase in cockle abundance at Bweleo and Chaleni . There was a slight increase in Bondeni and a continuous decrease in Nyamanzi from 2006 which was bad.

- **Possible Reasons**

- Larval recruitment from no-take zone enhances numbers in adjacent area where there was an increase and at Nyamanzi because of the poor site selection this was not possible.

What to do now?

- Keep up good work
- Maintain the sites where they are at present except for Nyamanzi there is a need to change it because since 2006 there is no improvement.
- Continue to keep poachers out especially at Chaleni
- Monitor catch rates and number of people harvesting to see if effort is going up and/or yields going up

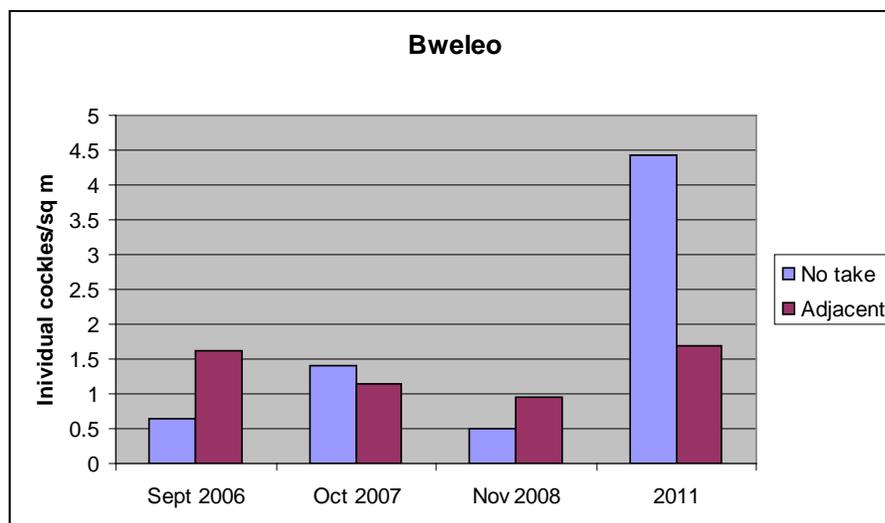


Figure 9: Comparison of number of cockles/square m between 2006 and 2012 in Bweleo

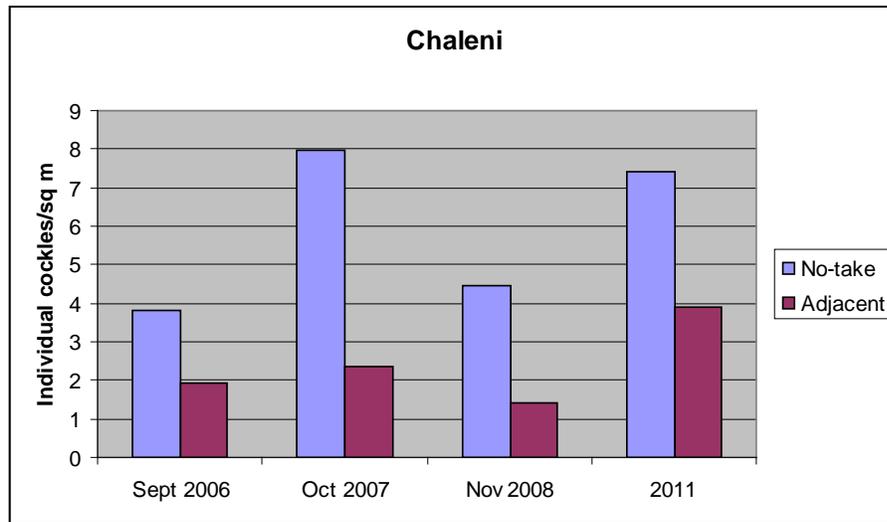


Figure 10: Comparison of number of cockles/square m between 2006 and 2012 in Chaleni

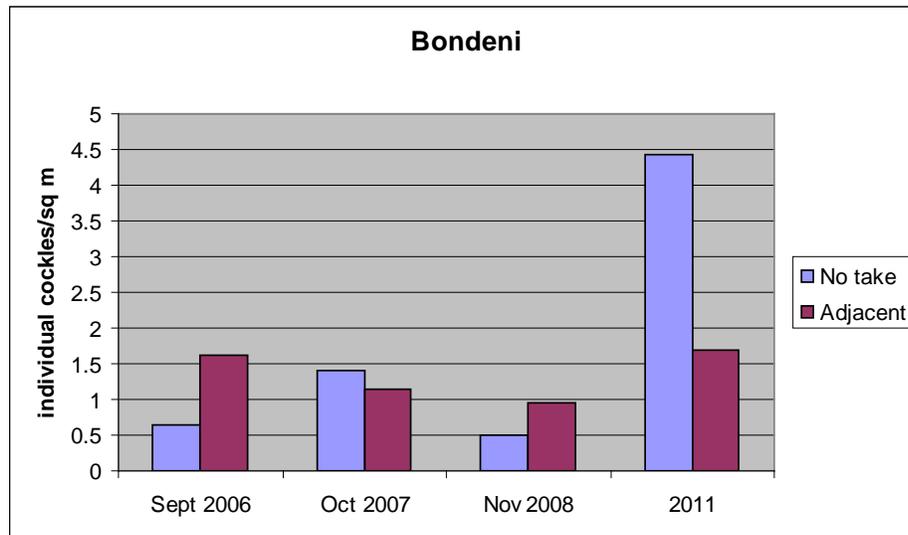


Figure 11: Comparison of number of cockles/square m between 2006 and 2012 in Bondeni

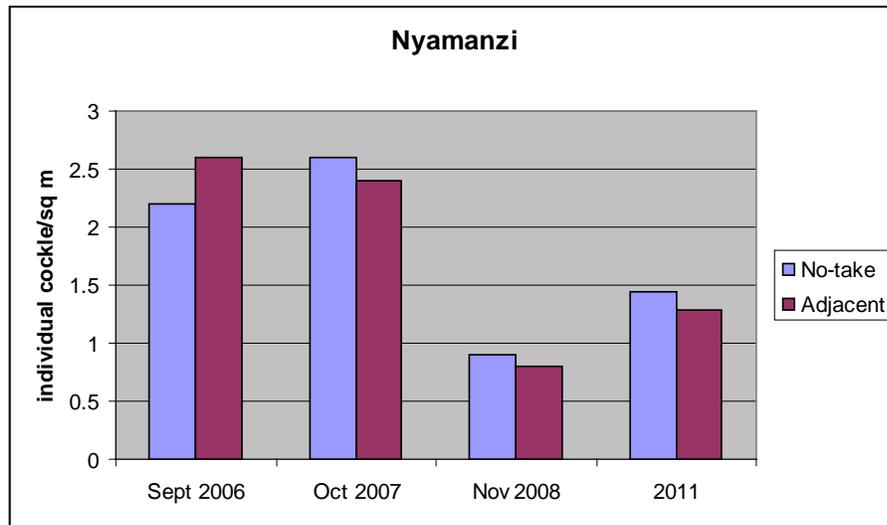


Figure 12: Comparison of number of cockles/square m between 2006 and 2012 in Nyamanzi

5. References

- 1** Ngowo, R.; **Jiddawi, N.**, Crawford, B. and Mmochi A. J. (2007). Management Plan for the Cockle Fishery on the Fumba Peninsular. Report and village bylaws submitted to the District Commissioner of the West District, Department of Fisheries and natural Resources and Menai Bay Conservation Area and Village governments for Fumba, Bweleo and Nyamanzi villages
- 2** Haws M, Crawford B, Ellis S, **Jiddawi N.** Mmochi A, Eladio Gaxiola-Camacho, Guillermo Rodriguez-Dominguez, Gustavo Rodriguez, Julius Francis, Carlos Rivas LeClair, Agnes Saborio, Nelvia Hernandez, Erick Sandoval, Konrad Dabrowski, Maria Celia Portella, Marta Jaroszewska, Nicolaus 2010 Aquaculture research and development as an entry-point and contributor to natural resources and coastal management. Basins and coasts news. IMCAFS/USAID Vol. 2 Issue 4: pp19 -29<http://imcafs.org>

6. Participants during the monitoring exercise of December 2011

Narriman Jiddawi - IMS
Mumin Hamadi – MBCA
Said Juma – Hatchery Technician
Yusuf Salmin – Bsc graduate in Marine Biology
Yusuf Salum – Msc student
In each village 8 community members participated.