Crab community structure as ecological indicator of Matang Mangrove Forest Reserve in Malaysia *(ongoing research)*

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Introduction

Matang Mangrove Forest Reserve (MMFR), is located in peninsular Malaysia(fig. 1) and have been managed to produce charcoal in a 30 year cycle (fig. 2) since 1902.

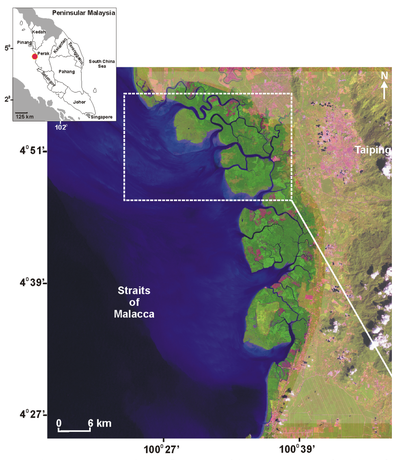

Figure 1. Location of MMFR (Goessens *et al.,* 2014)

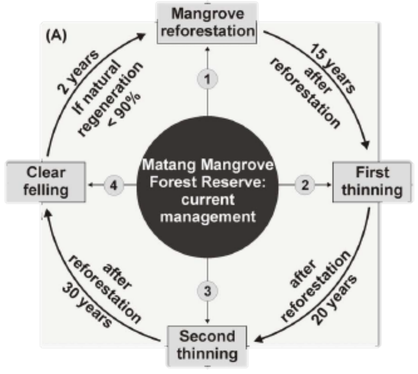

Figure 2. Charcoal production cycle. Diagram from (Goessens *et al.,* 2014)

Photo by Columba Martínez Espinosa

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Is the current management sustainable?

Some previous research work have been done to get an integrated picture (fig. 3). However, more work have to be done in the ecosystem functionality and maintenance of biodiversity.

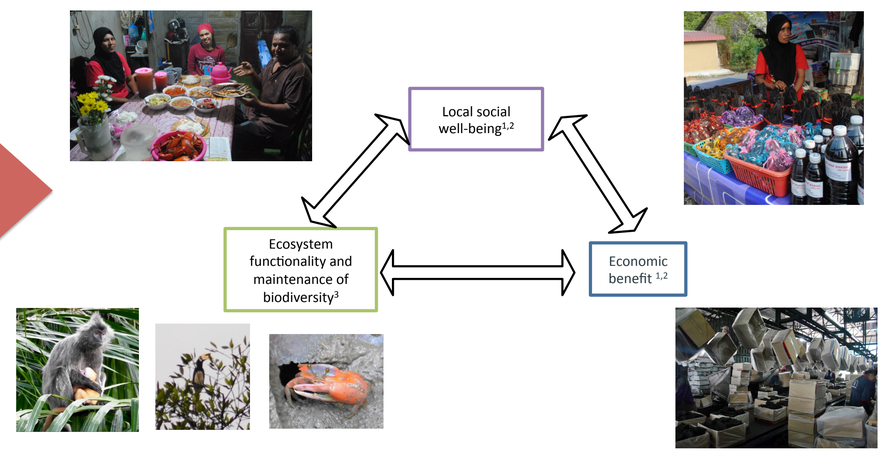


Figure 3. Sustainability components: Local Social well-being, Economic benefit & Ecosystem functionality and maintenance of biodiversity. [1](Quispe-Zuñiga *et al.*, 2014), [2](Hugé, *et al.*, 2016), [3](Sleutel, 2016). Photos by Columba Martínez Espinosa & Yannick Tatin.

In order to complete the sustainable assessment of MMRF. This work takes the crab community as ecological indicator because their relevance in the mangroves (fig. 4).

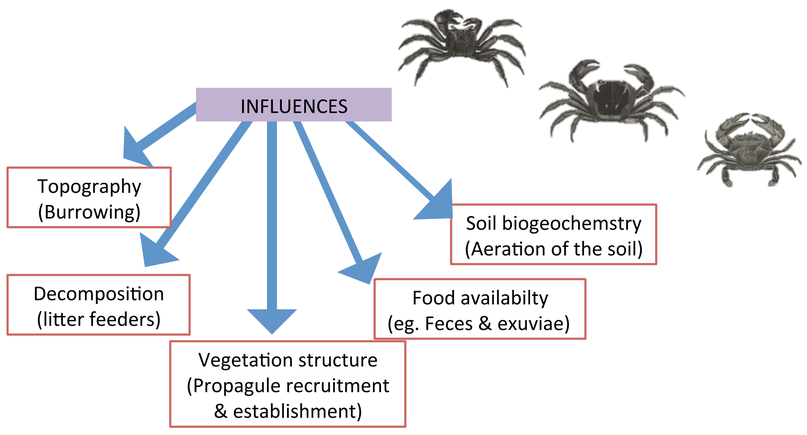


Figure 4. Importance of crab community in mangrove forest

Objective

To contribute to an integrated sustainability assessment of the management of MMFR

(1)To assess the current management regime of MMFR from social ecological point of view.

(2) To assess the functionality of the forest through abundances and densities of mangrove crabs

Materials & Methods

10 sample areas

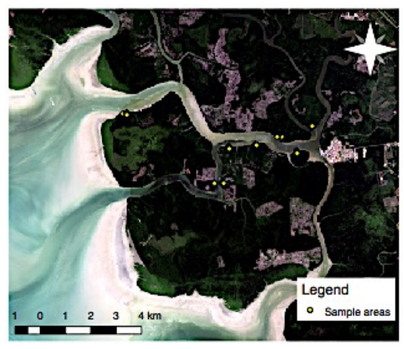


Figure 5. Map of MMFR with the sampled areas

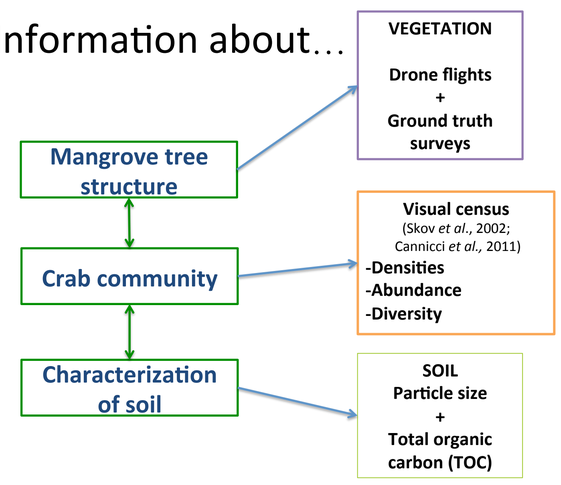
Photo by Columba Martínez Espinosa

1. Clear-felled area (0-2 yrs old)
2. Young forest (7-10 yrs old)
3. Mid age forest (15 yrs old)
4. Mature forest (30 yrs old)
5. Virgin Jungle Reserve (> 90 yrs old)

Data collection

June-August 2016

Information about…



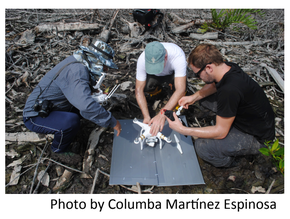


Photo by Columba Martínez Espinosa

Photo by Columba Martínez Espinosa

Photo by Yannick Tatin

Preliminary Results

Crab community →

- 675 specimens were recorded.
- 17 Species identified, from 5 Families

5 Functional Ecological Groups *

1. Mangrove herbivore /detritus feeder
2. Burrowing mangrove herbivore
3. Burrowing detritus feeder
4. Free-living macroalgae feeder
5. Burrowing benthic microalgae-bacteria feeder

*Unpublished classification of (Stefano Cannicci, Jaime R. Cantera Kintz, Daniele Daffonchio, Farid Dahdouh-Guebas, Karen Diele, Sara Fratini, Marco Fusi, Joe Lee, Inga Nordhaus, Francesca Porri)

- Vegetation data and crab community abundances was combined.
- The results shown (fig 6.) that the variation in forest *>90 yrs* is less than in *0 yrs* forest.
- In one site of 30 *yrs* forest there was recorded abundance of species that were different from the rest of areas sampled (overlapping zone).

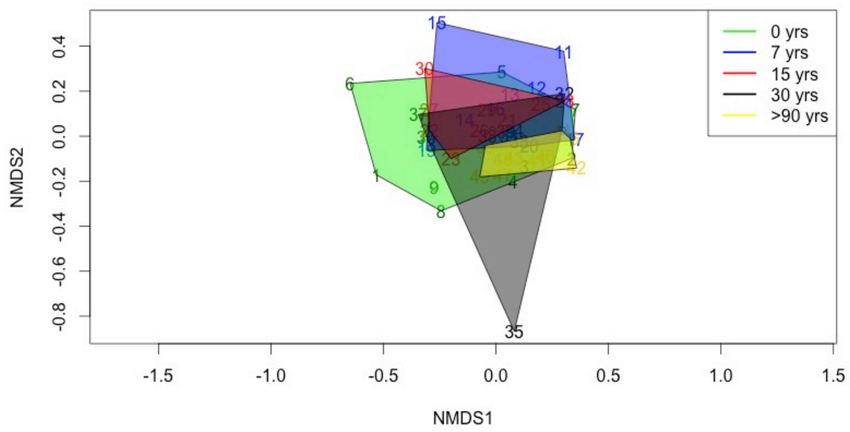


Figure 6. Ordination of crab community per age

Preliminary conclusions

- Variation in crab community is higher in managed forest than in the unmanaged forest
- Crab community seems to be an effective indicator of ecosystem structure differences

Further steps

- In deep characterization of crab community of each forest type
- Correlation of vegetation biomass and density with the crab community and soil composition

References

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