Building an ecologic-economic model to improve silvicultural management practices in Matang (Malaysia)

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Introduction

- The Matang Mangrove Forest Reserve (MMFR: 40, 288 ha) is well know for its systematic management since 1902.

- Even after >100 years, it is still considered as the best (sustainably) managed mangrove forest in the world.

- The productive (*Rhizophora*) forest is managed via 30 years rotation with two artificial thinnings at 15 and 20 years.

- While the poles extracted from thinnings are used for pilling, the 30-year old greenwood is used for charcoal production.

- However, the scientific literature on how this ecologic-economic system is maintained consistently and its importance for local livelihoods is still scarce.
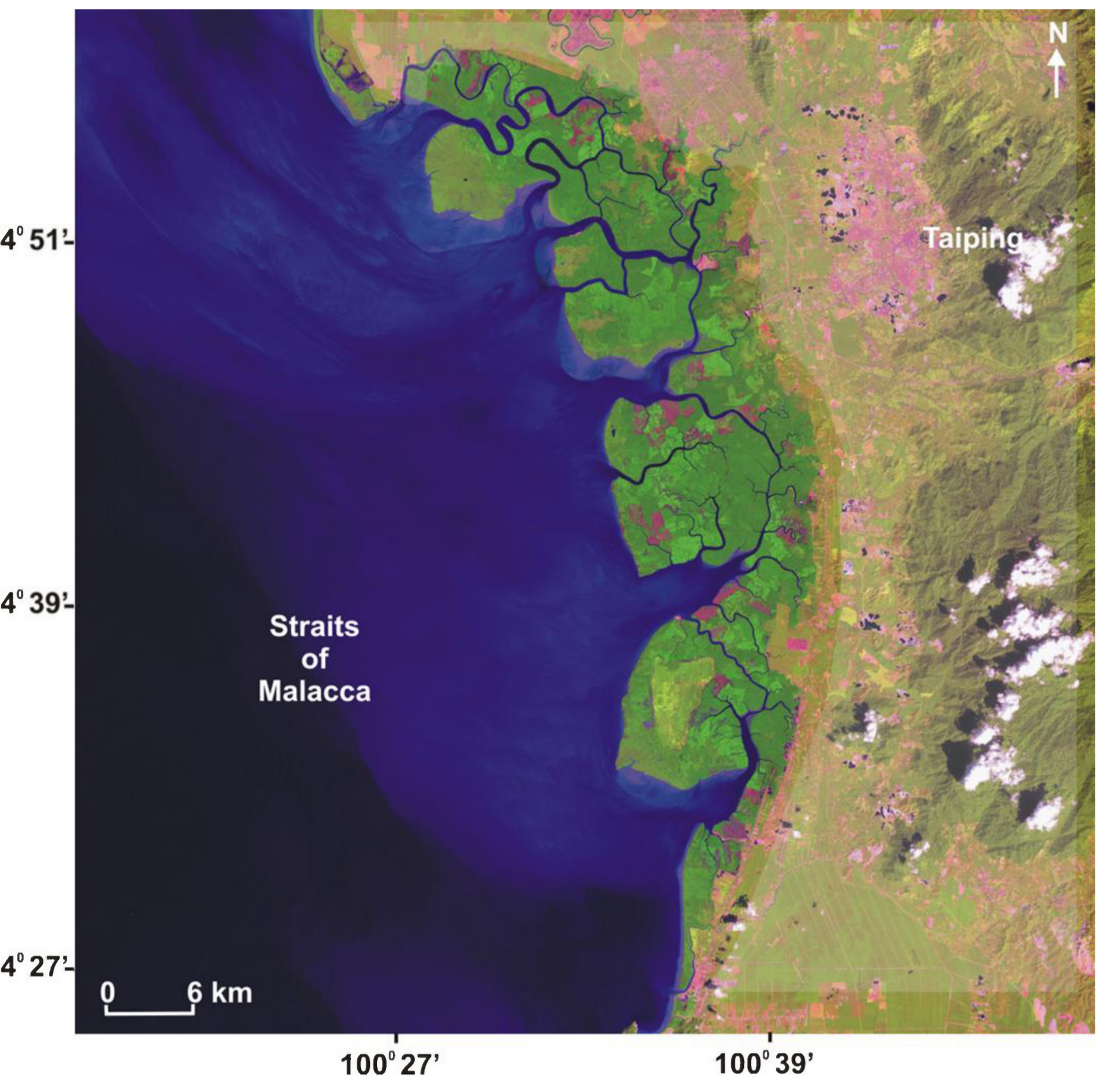
Objectives

- To understand the ongoing ecologic-economic system at the MMFR

- To assess the role of local people in mangrove management

- To improve the silviculture management by building an ecologic-economic (Agent-Based) model

Methodology

1. Questionnaire-based surveys at the three administrative zones - Kuala Sepetang, Kuala Trong and Sungai Kerang, of the MMFR (February 2014).

2. Total number of interviews conducted:
   - Charcoal kiln contractors : 26
   - Pole contractors : 8
   - Workers (forest cutters, transporters, kiln workers, etc.): 96
   - Wholesalers / exporters: 4

3. Parameterization into the ecologic-economic model (NetLogo *v* 5.04).

Preliminary Results

Table 1: The monthly income (in MYR) of a forest worker in the vicinity of MMFR

Job	Income		Minimum monthly income
	Minimum	Maximum	
Forest cutter	720	6000	
Boat driver	720	2000	
Logs arranger* (for kiln)	54	500	300 to 1200
Fire monitor*	100	450	
Charcoal bearer*	50	124	
Packing person*	32	1800	

*part-time profession   (1MYR=0.2294 EUR)

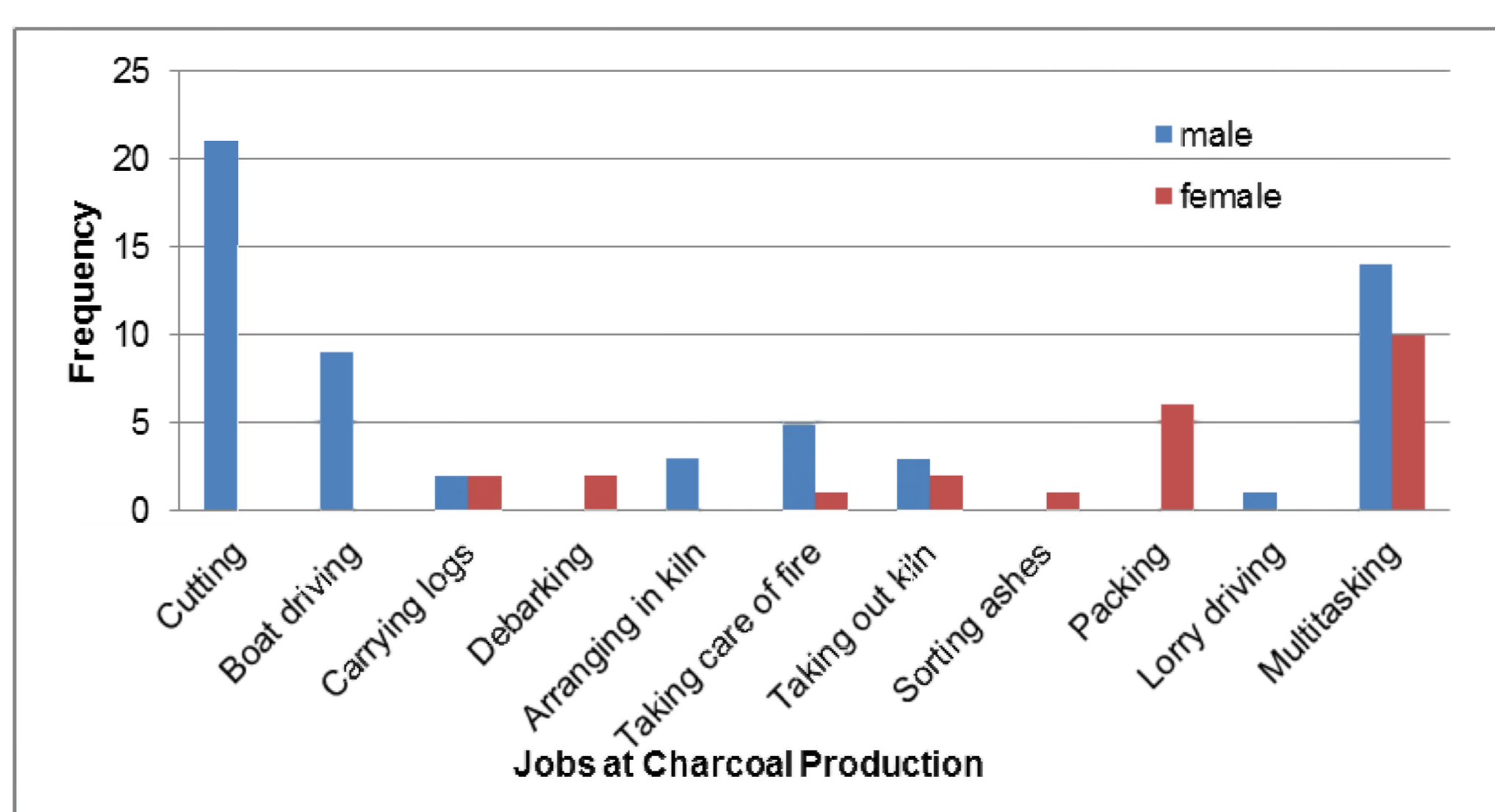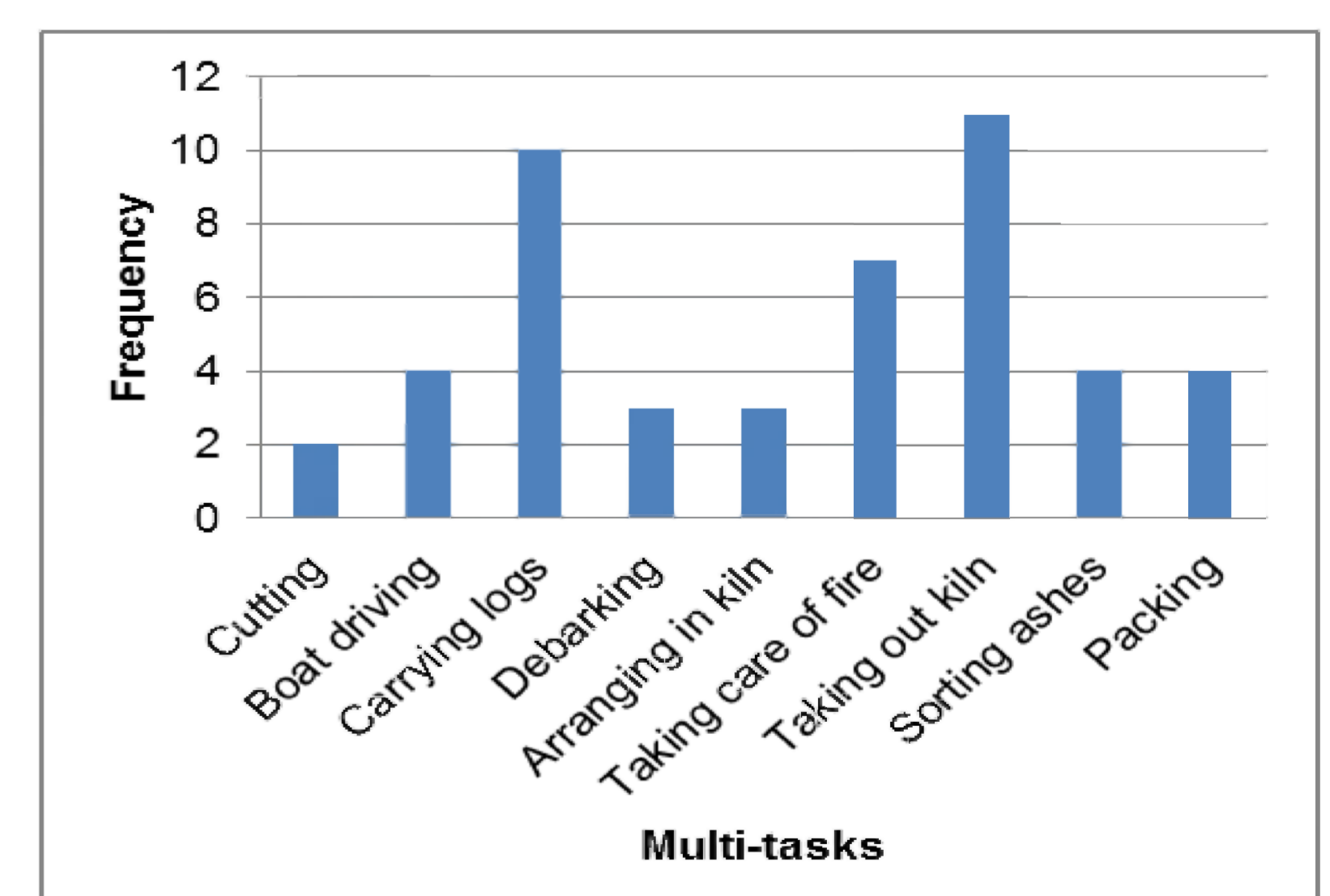Figure 1: Proportion of the interviewed personnel at charcoal factory

Figure 2: Frequency of the multi-task workers at charcoal factory

Ongoing Research Tasks

- In-depth data analyses and interpretation (including relevant statistics)

- Calibration of the model for implementing new relations between agents involved in the charcoal and the poles production (including tradeoff issues)