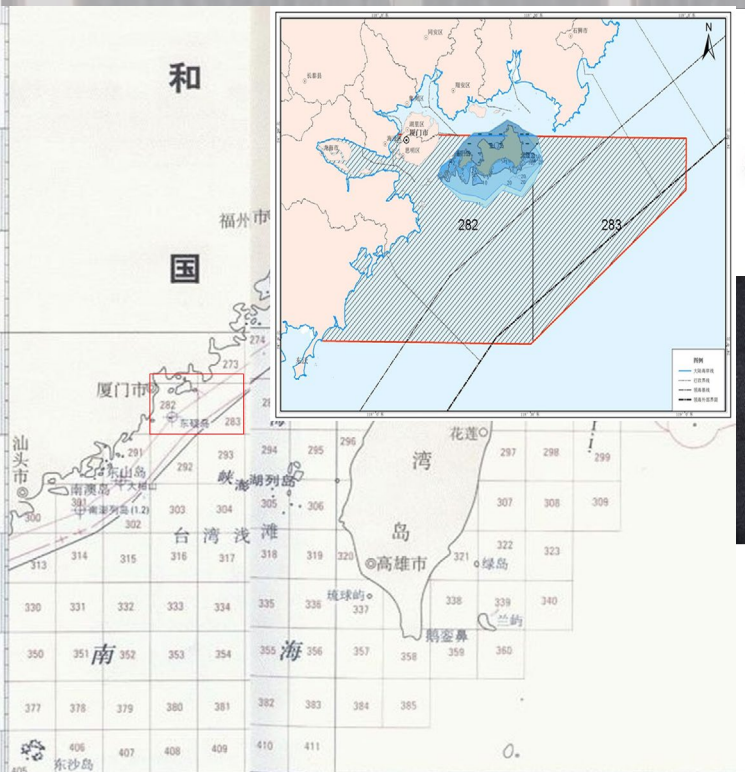
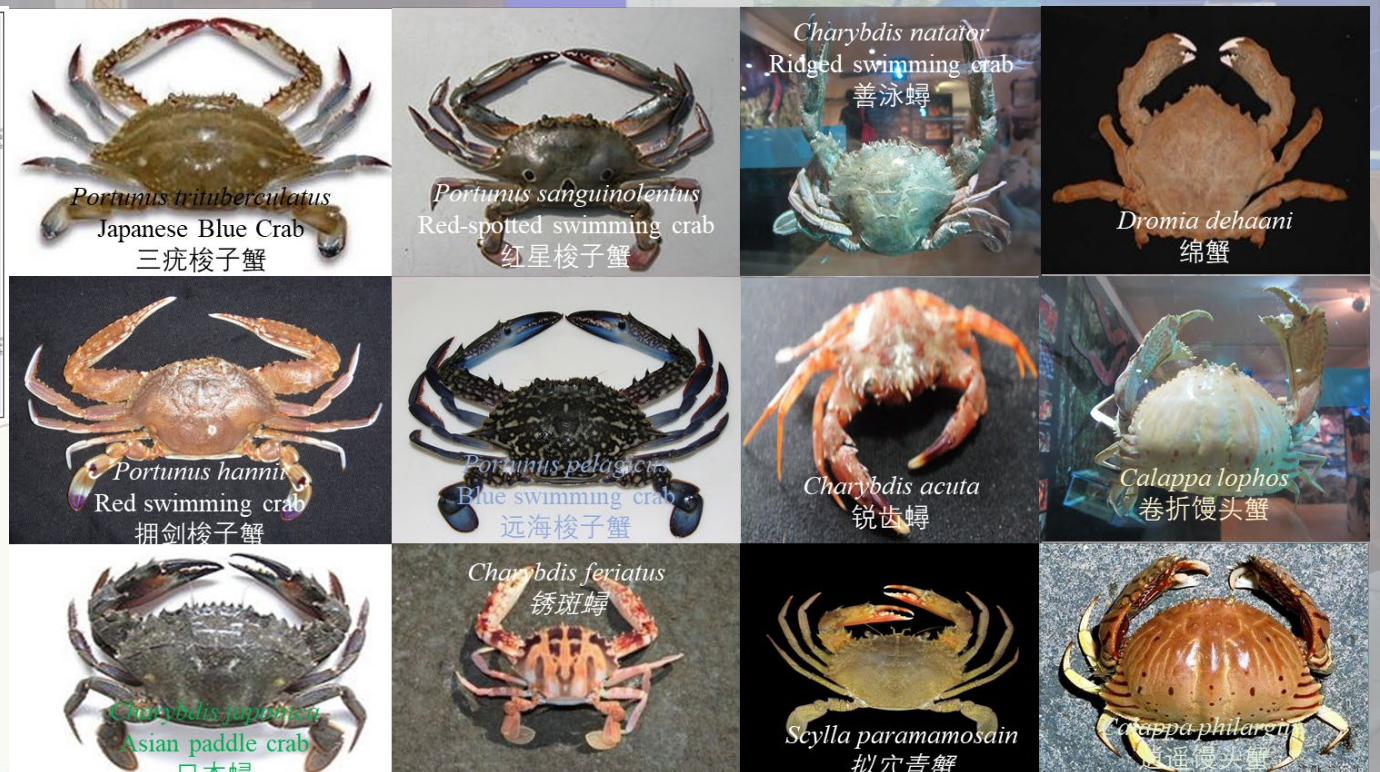
Modelling Socio-Ecological Systems: Methods And Tools for Scenario Development and Prediction

IMBeR Integrated Marine Biosphere Research

A Fishery System Approach Using Socio-Ecological Model: A Case Study Of Fujian Swimming Crab Fishery In China





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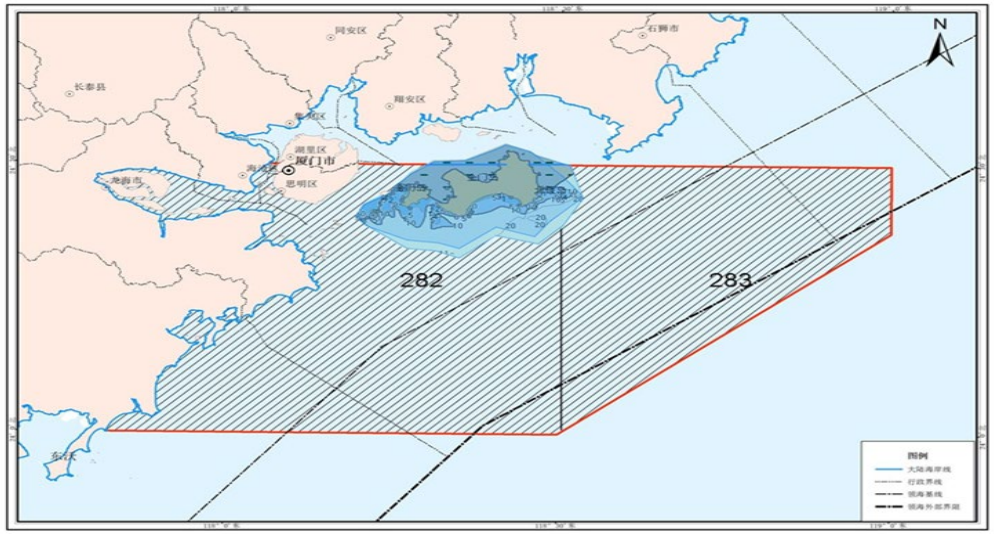
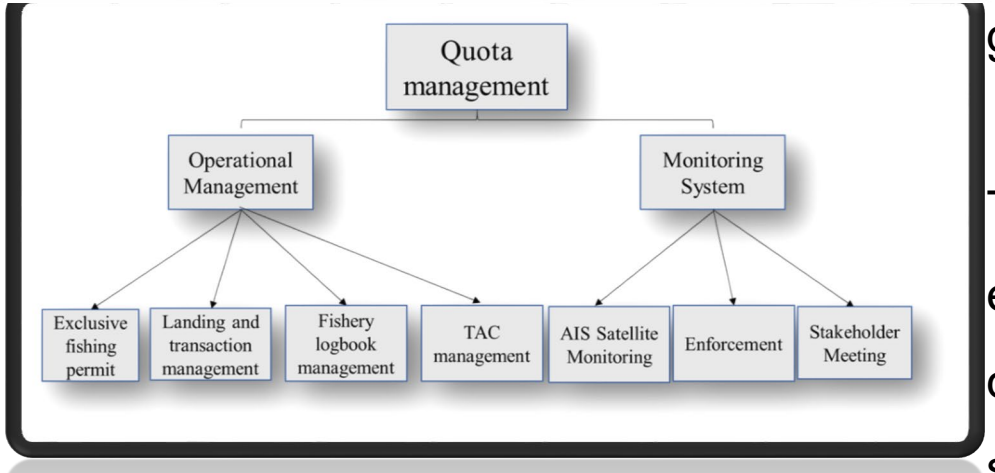
Issues





Swimming crabs are widely distributed in Indo – West Pacific regions. They are important global products but generally in poor management in developing countries (Seafood Watch).

China is moving toward its new marine fisheries paradigm (Cao et al. 2017). The pioneer efforts in China's new marine fisheries influences global capture fisheries (FAO, 2016).

This is an ongoing subnational pilot project starting from 2018 with the expected scenario of "marine fisheries healthy and sustainable development" (MoA, 2017). It has a premature understanding of sustainability and crab management practices.

Methods

Group	Connection to the Project
Government	Policy Making
Manager	Policy Implementation, Supervision and Monitoring, and Enforcement
Fisherfolk	Management Subject
Academia	Science Input
Industry	Financial Interest Related
NGO	Capacity Support

; Pitcher et al. (2013)

Results

Challenges

- Oversimplified multispecies complexities
- No universal understanding among stakeholders regarding the quota-based fisheries management system
- Misaligned stakeholder interests
- Inadequate management capacity for implementation
- Unequal stakeholder participation in the decision-making processes
- Incompatibility issues between national and subnational legislative framework

Dimensions	Indicators	Degree of Performance
Ecological	Exploitation status	Partially Understood
	Species changes	Partially Understood
	Vulnerability	Partially Understood
	Catch size	Partially Understood
	Catch before maturity	Partially Understood
	Bycatch	Partially Understood
	Migratory pattern	Partially Understood
Technological	Fleet capacity in relation to resource	Not Applicable
	Trend in catching power	Partially Understood
	Fishing gear side effects	Fully Understood
Socioeconomic	Infrastructure status	Fully Understood
	Extent of local ecological knowledge	Fully Understood
	Equity in fishing benefits	Not Completed
	Marketing system	Partially Understood
	Commoditization	Fully Completed
Ethical	Alternatives	Not Applicable
	Just governance	Partially Completed
	IUU fishing	Not Completed
Institutional	Policy support	Fully Completed
	Governance qualify	Not Completed
	Subsidies	Partially Completed

Fully Completed / Understood
Partially Completed / Understood
Not Completed / Understood
Not Applicable

Implications and Recommendations

Legal perspective: Enforceable management plan under a compatible national legislative framework

Management perspective: a good fisheries management scope + good management basis

Scientific perspective: mixed fisheries complexity; biologically sustainable

Human-dimension perspective: equity, compliance, aligned stakeholder interests

Open-access Fishery → Well-Managed Fishery → Catch Share Program

To maximize the fishery benefits,

Understanding multifaceted fisheries system characteristics in the targeted fishery

Specified socio-economic objectives in the fisheries management plan

Thank you!