



**Ecosystems 2010: Global Progress on  
Ecosystem-based Fisheries Management**  
*26th Lowell Wakefield Fisheries Symposium*

**Session 3: Human Dimensions**

# **The Conflict Resolution in Building Marine Protected Areas**

**Reporter: Kuei-Chao Chang**

**Institute of Ocean Technology and Marine Affairs, NCKU**

2010/11/10



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>





# Outline

- ▶ Introduction
- ▶ The Analytical Framework
- ▶ Results and Discussion
- ▶ Conclusions



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>



# Introduction(1/3)

- The traditional fishery management couldn't effectively reserve fisheries resources.
- MPAs have been considered important tools of fishery management in the ecosystem-based fishery management (EBFM) (Browman, 2004).
- In order to implement the Successful programs of EBFM have to encourage participation of stakeholders (Gray, 2008).



# Introduction(2/3)



## ● Taiwan Status

There is only 5% maritime space belong to coral reef waters, but it almost surround Taiwan's northern and southern waters. **Taiwan own ~10% species on the world.**

However, **overfishing** and **environmental degradation** during the recent years have caused a crisis of marine resources reduction and habitat loss.

It is essential to set up a protected area to assure the **sustainable utilization** of marine resources.



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>





## Introduction(3/3)

- **This study analyzed the cognition of EBFM among stakeholders during the period of implementation MPAs .**
- **The study focus on the cooperative relationship of stakeholder in different programs that applies a game theory to find out optimal solutions.**
- **Further, according to the concrete notice to assists authorities to resolve stakeholder conflicts.**





# The Analytical Framework(1/2)

The government programs :

- A、Ecosystem-based management Program
- B、Fishery Compensation Program
- C、Recreation Fishing Village Program

The Influence of Stakeholders :

Stakeholders	Influence(%)
Local Fisherman	40%
Conservative Group	25%
Tourist Industries	35%



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>





# The Analytical Framework(2/2)

## The Methods of Analysis

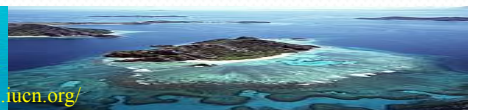
- **Focus Interview** → Supporting of Stakeholder
- **Game Theory** → Optimal Payoff  
Optimal Coalitional strategy



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>





# Results and Discussion(1/3)

## The Transformation of Supporting

Degree of supporting → Weight of supporting

Weight of Supporting = (Degree of supporting - 3) x Influence

	Supporting			Weight of Supporting		
	Local Fisherman	Conservative groups	Tourist industries	Local Fisherman	Conservative groups	Tourist industries
EBM	3.5	4.0	3.0	0.20	0.25	-0.35
FC	4.5	1.0	2.0	0.60	-0.50	-0.35
RFV	1.5	2.0	4.0	-0.60	-0.25	0.35

EBM= Ecosystem-based management, FC= Fisheries compensation, and RFV= Recreative fishing village programs.





## Results and Discussion(2/3)

### The optimal payoff between programs and stakeholders

	Local Fisherman	Conservative Groups	Tourist Industries	Total
EBM	0.550	0.775	0.175	1.500
FC	0.581	-1.188	-0.894	-1.500
RFV	-1.050	-0.688	0.238	-1.500

EBM= Ecosystem-based management, FC= Fishery Compensation, and RFV= Recreative Fishing Village.



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>



# Results and Discussion(3/3)

## The results of coalitional games

Coalition	Program		
	EBM	FC	RFV
(1) (2) (3)	(0.200, 0.250, -0.350)	(0.600, -0.500, -0.3500)	(-0.600, -0.250, 0.350)
(1,2) (3)	(1.325, 0.175)	(-0.608, -0.894)	(-1.7375, 0.2375)
(1,3) (2)	(0.725, 0.775)	(-0.3125, -1.1875)	(-0.8125, -0.6875)
(1) (2,3)	(0.55, 0.95)	(0.58125, -2.08125)	(-1.04, -0.45)
(1, 2, 3)	1.5	-1.5	-1.5

1= Local Fisherman, 2= Conservative Groups, and 3= Tourist Industries.

EBM= Ecosystem-based management, FC= Fishery Compensation, and  
RFV= Recreative Fishing Village.



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>





# Conclusions

- The results of the analyses demonstrate that the cooperation of stakeholders can advance implementation of project.
- Because of the difference of interest, however, the resolution of conflict can be used the cooperative method.
- Building common consensus is important with regard to the implementation of ecosystem-based management, consequently, not only considers the eco-economic phase, but the viewpoint of social-ecology should be involved into the process of EBM.



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>





# Thank you



<http://marine.gov.tw/indexC.aspx>



<http://cms.iucn.org/>

