

# Measuring Transaction Costs of Fisheries Co-Management in San Salvador Island, Philippines<sup>1</sup>

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## Abstract

It is generally accepted that co-management systems are more cost-effective than centralized management of natural resources. However, no attempts have been made to empirically verify the transaction costs involved in fisheries co-management. Some estimates of transaction costs of fisheries co-management in San Salvador Island, Philippines, are presented in this paper. These estimates are used to compare the various transaction costs in co-managed and in centrally managed fisheries in San Salvador Island.

## Introduction

One of the purported advantages of co-management over centralized management is that it will reduce transaction costs – the costs of gaining information about the resource, reaching agreements and coordinating with others in the group with respect to the use of the resource, and enforcing agreements that have been reached (Abdullah et al. 1998b). Hanna (1995) points out that a centralized approach is often associated with low program design costs but high implementation, monitoring and enforcement costs as the management regime may have little legitimacy with user groups. A co-management approach, on the other hand, is associated with high program design costs as effective participation is time-consuming and expensive. However, co-management is likely to lead to lower implementation, monitoring and

enforcement costs, as the acceptance of the regime is greater.

## Transaction Costs in Fisheries Co-Management

When multiple individuals are involved in situations where complex activities need to be coordinated across space and over time, they may attempt to reduce the substantial uncertainties they face through various forms of implicit or explicit agreements. These contracts involve costs expended in the processes of reaching an agreement and continuing to coordinate activities after an initial agreement is reached. Williamson (1985) identifies the costs associated with contracting activities as *ex ante* and *ex post* transaction costs. Using Williamson's generic description of transaction cost economics, the transaction costs in fisheries co-

management can be broadly categorized into three major groups: (i) information costs; (ii) collective decisionmaking costs; and (iii) collective operational costs. The first two are *ex ante* transaction costs while the latter is an *ex post* transaction cost. The transaction costs arise from need for information, coordination and control that stems primarily from the fact that fisheries resources management decisions involve multiple actors with different long-term interests and processes that are interdependent and uncertain. Abdullah et al. (1998b) provide a detailed discussion on these three types of costs.

## Co-Management Experience in San Salvador Island

San Salvador Island is a 380 ha *barangay* (village) that forms part

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of the municipality of Masinloc in the province of Zambales, Philippines. It lies on the western coast of Luzon, about 250 km from Metro Manila. San Salvador had a population of 1 620, comprising about 284 households, in 1996. Fishing and farming are the dominant economic activities. The San Salvador fishery is multispecies, multigear and mainly artisanal. Fishers target both food fish and aquarium fish.

Fishers recalled that before World War II San Salvador had abundant marine resources, non-destructive fishing methods were used, and it had a relatively homogeneous population. There was no need for property rights and rules to govern fishing activities as there was no competition for the use of resources. Access to the fishery was unrestricted.

During World War II (early 1940s), Japanese troops occupied the island of San Salvador and sometimes used explosives to catch fish, marking the early beginnings of blastfishing in the area. Until the 1960s, most village fishers continued to use non-destructive, traditional fishing methods such as hook and line, improvised spear gun and gillnet.

The 1970s ushered in an influx of Visayan migrants who were searching for better fishing grounds and who decided to settle in San Salvador, particularly in Cabangun (now Purok Maligaya). The decade saw a pronounced shift to non-traditional and destructive fishing operations such as blastfishing, aquarium fish collection using sodium cyanide and spearfishing with air compressors, which eventually devastated San Salvador's fishing grounds. The 1970s also marked the integration of San Salvador into an export-oriented market for aquarium fish via traders who visited the village.

The lack of knowledge of marine ecosystems and the long-term effects of destructive fishing methods could have led to irreversible damage were it not for the timely intervention of external agencies. In March 1987, a Peace Corps volunteer working with the Bureau of Fisheries and Aquatic Resources (BFAR) arrived in San Salvador. He spent a year in assessing the needs of San Salvador, the level of environmental awareness of village residents and the status of coral reefs around the island. He initiated dialogues with village officials, the municipal mayor, nongovernment

organizations (NGOs) and the BFAR. In the process, he gained support for rehabilitating the fishery resources of San Salvador. Thus, the concept of a marine sanctuary emerged in 1988.

A project proposal on the Marine Conservation Project for San Salvador (MCPSS), prepared by the Peace Corps volunteer, was approved and funded by the Netherlands Embassy and the Jaime V. Ongpin Foundation from 1989 to 1991. Additional financial support beyond the two-year period came from the World Wildlife Fund's Debt-for-Nature Swap Program until 1993. The Haribon Foundation, as the implementing NGO, provided personnel and logistical support to the project.

From 1989 to 1993, the Haribon Foundation, the municipal government of Masinloc and the San Salvador community jointly implemented the MCPSS. In 1993, the Haribon Foundation turned over the project to the people's organization (PO) it helped establish, known as the *Samahang Pangkaunlaran ng San Salvador* (SPSS). The SPSS, whose beginnings could be traced to the *Lupong Tagapangasiwa ng Kalikasan* (LTK), formally evolved from the core group established by Haribon and registered with the Securities and Exchange Commission in 1993. Despite the phaseout of the Haribon Foundation in 1993, project initiatives were sustained by the village and the municipal government, demonstrating that they could share responsibility for fisheries management. The MCPSS adopted a community-based approach to resource management and was a vital springboard for making co-management prosper in San Salvador. In 1996, SPSS and the municipality of Masinloc were awarded the *Galing Pook Award* for the best community and local government unit (LGU) initiated sustainable development project in the Philippines.

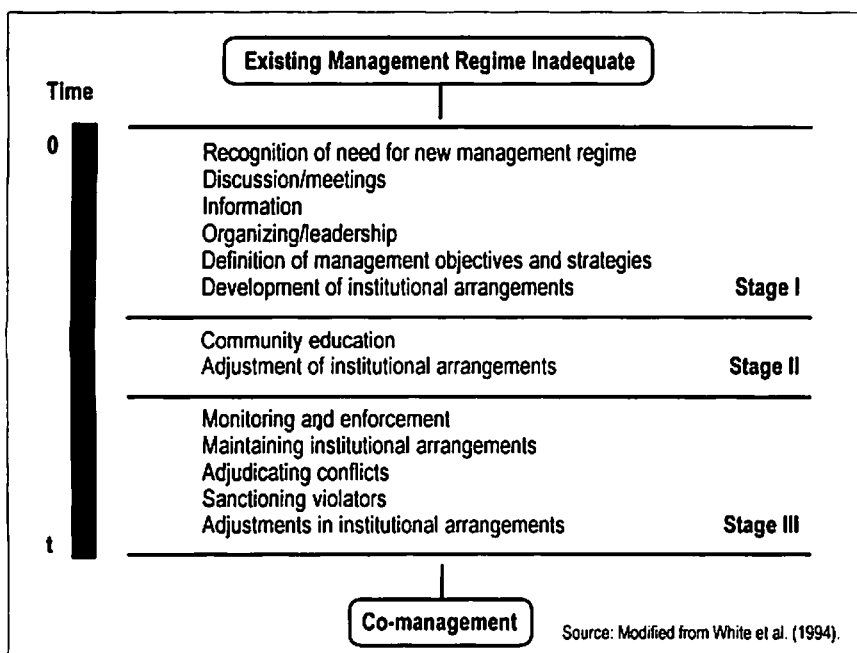


Fig. 1: Process of moving towards co-management.

## Methodology

The time horizon for MCPSS was divided into three stages (Fig. 1). Stage I is defined as the inception stage wherein people in San Salvador started conceptualizing and implementing the first phase of the marine conservation project (1988-1989). Stage II is defined as the stage wherein the local island organization (LTK/SPSS), in partnership with the Haribon Foundation, went ahead with educating the community of the new arrangements and rules for protecting and managing the marine sanctuary project (1990-1993). Stage III is the stage wherein management of the sanctuary was completely turned over by Haribon Foundation to SPSS to be run autonomously by the local people's organization (1994-present). Data on costs and time spent at all stages were gathered from literature and key-informant interviews, surveys, the files of government and municipal offices and the NGOs involved in the project.

The costs estimated for the government financed management system were then compared with those of a case study site managed under a co-management system in terms of efficiency and overall effectiveness in preventing resource degradation.

## Results

The comparison of costs for the two systems for the period 1988-1996 (Table 1) indicates that there is a difference at the three stages of co-management. In stages I and II, that are the stages of recognizing a resource problem, holding discussions, developing a management strategy, initiating a new management regime, community education and adjustments of institutional arrangements (Abdullah et al. 1998a, b), the costs are higher for the co-management system compared to the centralized government system. This is to be expected as these are the costs of

**Table 1. Costs (in Philippine pesos) of alternative fisheries management systems in San Salvador.**

	Total (1988-1996)	Stage I (1988-1990)	Stage II (1991-1992)	Stage III (1993-1996)
<b>Govt Mgt</b>				
National Govt	3 351 330	438 575	450 902	2 461 853
Local Govt	393 954	8 320	16 640	368 994
Total	3 745 284	446 895	467 542	2 830 847
<b>Co-Mgt</b>				
Direct cash infusion	1 430 522	737 272	573 250	120 000
Counterpart labor	2 430 000	810 000	540 000	1 080 000
Total	3 860 522	1 547 272	1 113 250	1 200 000

US\$1 = Php26.00 in 1996.

planning and implementing the co-management system and represent a major part of the transaction costs. These costs are primarily for nonrecurrent activities. The costs decrease and stabilize in the third stage when the major activities are monitoring, enforcement and conflict management. These are primarily continuous or recurring costs. The costs in stage III for the co-management system are lower than for the centralized management system.

These findings appear to be consistent with the views of Hanna (1995) and Abdullah et al. (1998a, b) that the downstream or imple-

mentation costs are likely to be lower for a co-managed system (Table 2). This is because the cost of monitoring and enforcement is likely to be lower as community members are more likely to comply with rules and regulations developed by the community as a whole as opposed to regulations imposed by an external regulatory authority. This was the case in San Salvador as earlier research found higher levels of compliance among fishers after the co-management system was implemented (Katon et al. 1999). This is important from a policy perspective as the operating costs in stage III are the

**Table 2. Transaction costs in centralized and co-managed systems.**

Resource management activities	Centralized management	Co-management
Information seeking	Low	High
Decisionmaking and setting management objectives	Low	High
Resource distribution among users	High	Low
Resource distribution over time	High	Low
Monitoring, enforcement and compliance	High	Low
Resource maintenance	High	Low

Source: Abdullah et al. (1998b)

**Table 3. Cost and time spent as co-management activities (Stage III).**

Activity	Time (hour/year)			Cost (peso/year)		
	Members	Nonmembers	All (Ave.)	Members	Nonmembers	All (Ave.)
Information gathering	40.8	22.3	31.5	9 467	5 238	7 352.5
Attending meetings	38.4	10.8	24.6	4 072	3 267	3 669.5
Training	18.2	7.3	12.7	1 190	3 833	2 511.5
Conflict resolution	10.3	2.8	6.5	943	20	481.5
Monitoring	322.5	1.1	161.8	24 467	135	12 301
Communicating	8.9	4.7	6.8	0	0	0
Decisionmaking	24.4	29.1	26.8	3 428	1 156	2 292
Project maintenance	75	13.2	44.1	2 057	1 964	2 010.5
Enforcement	1.6	0.06	0.8	0	0	0
Others	6	1.8	3.9	0	0	0
<b>Total</b>	<b>546.1</b>	<b>93.2</b>	<b>319.6</b>	<b>45 624</b>	<b>15 613</b>	<b>30 618</b>

costs encountered on a continuous basis. This indicates that the overall costs of managing fisheries resources under a co-management system may be lower.

Table 3 gives a breakdown of the average time and money spent by an individual member and non-member on the various activities of the San Salvador co-management system during stage III for the year 1996. It is clear that monitoring takes up the bulk of the time (50 percent) and cost (40 percent) in stage III as it is a continuous day to day activity and is crucial for the operation of the system. The fact that monitoring takes up half of the total time of the fishers involved in the co-management system indicates the importance of this activity for effective management.

## Policy Implications

The hypothesis that transaction costs will be lower under a co-managed system appears to have some support from the data used in this study. Although direct comparisons between co-managed and centrally managed systems are difficult to make, this study of a small island in the Philippines that has experimented with co-management

of fisheries provides an opportunity for such a comparison. The problem with comparisons of this nature is that both the co-managed and the centralized government managed systems are present together. This study indicates that even if that is the case, as monitoring costs are the major portion of transaction costs and monitoring is more effectively undertaken by the community, these costs will decline over time as community acceptance of the rules and regulations for managing the common property increases. The data show that costs associated with managing common property are lower in the later years (e.g., fifth year onwards) under a co-managed regime than under a purely government managed regime.

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