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Analysis

Do non-users value coral reefs?: Economic valuation of conserving Tubbataha Reefs, Philippines☆

Rodelio F. Subade [a,*], Herminia A. Francisco [b]

[a] Division of Social Sciences, University of the Philippines Visayas, Miag-ao, Iloilo 5023-A, Philippines
[b] Economy and Environment Program for Southeast Asia, Worldfish Center, Penang, Malaysia

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ABSTRACT

The main purpose of the study is to determine whether non-use values exist among residents of Quezon City, hundreds of kilometers away from Tubbataha Reefs. The dichotomous choice contingent valuation method (CVM) was employed across 800 randomly selected respondents, 400 of which were personally interviewed (PI) and 400 were asked to accomplish self-administered (SA) questionnaires, 198 of the latter were found useable for the study. Results showed that 46% of all respondents were willing to pay for conservation of the reefs, with bequest motive or concern for future generations as their main reason. The mean WTP ranged from 437 pesos for PI respondents to 233 pesos for SA respondents. These substantial non-use values justify the need for regular government appropriation for conserving Tubbataha Reefs.

1. Introduction

In response to the global imperative of conserving biodiversity, the Philippines has joined the world-wide efforts to conserve various habitats in both the terrestrial and marine ecosystems through the enactment of the 1993 National Integrated Protected Area System Act (Republic Act No. 7586) and other legal instruments, which would establish protected areas across the country and arrest biodiversity loss. In 1999, the Haribon Foundation for the Conservation of Nature (Pajaro et al., 1999) tabulated a total of 439 established marine protected areas (MPAs) in the Philippines, but not more than 20% of these were fully implemented MPAs. Funding and the lack of institutional infrastructure have become the major limiting factors for fully implementing MPAs. Various funding agencies have strove to fill-in the gaps for implementation, but the gargantuan lack still persists. Foremost of the fully implemented MPAs is the world-renowned Tubbataha Reefs National Marine Park (TRNMP), a UNESCO World Heritage Site covering 33,200-hectare area in the middle of Sulu Sea.

The TRNMP is an environmental resource believed to possess the highest level of marine biodiversity. It is the largest coral reef atoll in the country, well known among fishers in Southern Philippines, and one of the most popular dive sites around the world. TRNMP harbors a rich diversity of marine life equal to or greater than any such area in the world — more than 396 coral species, at least 45 families and 441 species of fish were recorded in the reefs (WWF — Philippines, 2004). Indeed, the Tubbataha Reefs is a very unique habitat worth preserving and conserving, and can serve as a great national pride and identity for Filipinos throughout the world.

2. Conserving the Tubbataha Reefs

The TRNMP has attracted both perennial admiration and, sadly, habitat destruction particularly in the 1980s, when established management and conservation policy for these reefs were still lacking. Surveys showed that in the said period, fishing which often used destructive methods transpired in the reefs. In 1989, observations revealed that living coral cover on the outer flats declined by 24% (Arquiza and White, 1994).

Like any resource, the open-access nature of Tubbataha Reefs prior to 1988, brought forth the wanton use and misuse of the resource therein. To arrest the downward trend towards habitat destruction and biodiversity loss, a series of efforts, declaration and legislation from different sectors and the government were undertaken in the 1990s highlighted by the issuance of Proclamation No. 306 on August 1, 1988 declaring it as a national marine park — the Tubbataha Reef National Marine Park (TRNMP) and UNESCO declaration as a UNESCO World Heritage Site on December 1993 (White, Vogt and Arin, 2000).

The improving reef quality since 1989 was cited as an indicator of success of the above conservation efforts (White, Vogt and Arin, 2000). However, a major constraining factor in sustaining the conservation efforts is the continuous availability of needed resources, mainly funding. Fig. 1 shows that from an average of approximately US $50,000 yearly budget in 1996–1999, funding peaked to US$327,000 in year 2000, which is the start of the four-year GEF grant. With the

☆ Exchange rate during the time of the study was US$1 = PHP52.

* Corresponding author. Fax: +63 33 338 1534, +63 33 513 7012.
E-mail address: redabus@yahoo.com (R.F. Subade).

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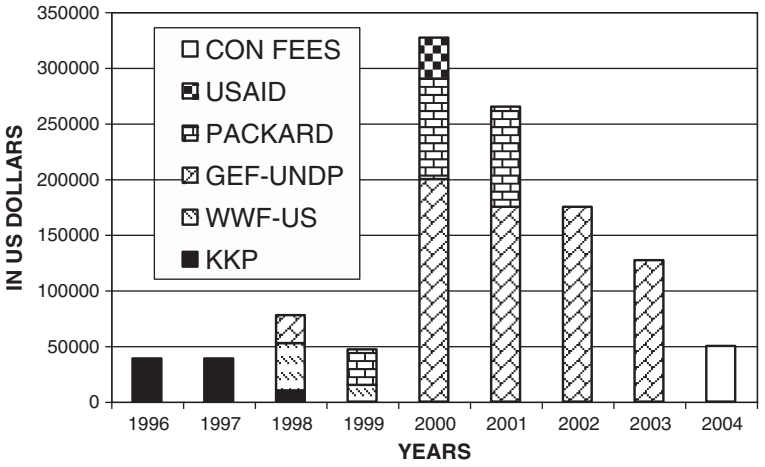

Legend:

WWF-US = Endangered Seas Campaign of the World-Wide Fund for Nature - U.S.A.
KKP = Kabang Kalikasan ng Pilipinas (WWF-Philippines)
GEFUNDP= Global Environmental Facility of the United Nations Development Program
USAID = United States Agency for International Development
PACKARD= Lucille Packard Foundation
CON FEES= Conservation fees (from 2000-2003) saved through trust funds
Source: Kabang Kalikasan ng Pilipinas (WWF-Philippines)

Fig. 1. Funding sources for management and conservation of TRNMP.

grant-dependent nature of funding, conservation financing for 2004 and beyond was uncertain. Despite the effort to collect conservation fees from the users of TRNMP starting year 2000, this does not seem to be a stable, nor an adequate source of conservation funding. Fig. 2 shows that although users' fees have progressively increased up to 4.86 million pesos in 2006, it has remained inadequate as an only source of the annual budget for the conservation of Tubbataha, which stood at 6 million pesos or US$120,000. As per information from the Tubbataha Management Office, the annual budget has been shouldered because there are other partner institutions which provide supplemental or complementary funding of specific projects (like research). Moreover, the actual expense on the salaries of Philippines Coast Guard and Navy personnel, who have been assigned as marine park rangers, have been incorporated in the budget of those agencies.

Resource insufficiency, particularly the need for a regular and bigger conservation budget, is highlighted by the huge area to be conserved, managed and patrolled, such that, Taiwanese and Chinese fishing boats were caught poaching in the area in 2000 and 2001, respectively. The evident lack of government commitment to provide consistent and sufficient funding for TRNMP conservation could be seen through the Presidential Task force which was disbanded due to lack of funds, and the limited naval patrols around the marine park.

However, in order to sustain the momentum towards conserving and protecting the TRNMP, continuous source(s) of funding are needed.

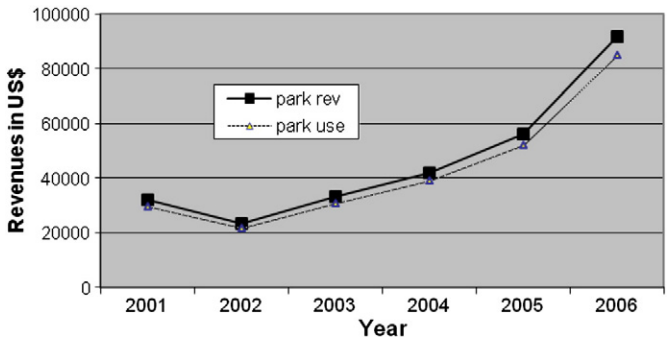

Fig. 2. Tubbataha RNMP revenues from diver fees.

Resource under-valuation or the failure of either the market or government to capture all the benefits of the natural resource, can lead to its mis-use, misallocation or ruin.

Like any natural resource, foregone direct use benefits due to conservation are substantial social costs, which government or communities may not easily give up for biodiversity conservation. In addition, due to lack of information on how the citizens value conservation (non-use values), it might be difficult to justify consistent government budget allocation for conservation (Subade, 2007). Dixon and Sherman (1990) argued that since conservation benefits are only partially accounted for, smaller areas are protected than what is socially desirable. This market failure stems from difficulty to capture conservation benefits, thereby resulting to governments' inadequate budget allocation for management.

"It is believed that the increasing environmental awareness by Filipinos over the importance of marine habitats, coral reefs ecosystems in particular, has produced a significant set of beneficiaries (of the marine conservation) who live hundreds of kilometers away from the site where protection or conservation activities take place. Once found that citizens value the conservation of a richly biodiverse habitat like the TRNMP, a strong basis for continuous government and social funding of the conservation efforts lends a strong rationale that cannot be ignored" (Subade, 2007). This paper focuses on how non-users value a distant biodiverse habitat, and determine their willingness to pay (WTP) for its conservation.

3. Methods

Considering the dominantly non-use value and non-market nature of biodiversity conservation, or biodiversity per se, the contingent valuation method (CVM) stands out as the most appropriate economic valuation method used for this study. Mitchell and Carson (1989) expound in depth the various aspects of CVM, which may be employed to estimate values not intimately linked to use — for example, the desire of individuals to pass pristine natural environments on to future generations. They claim that CVM "is potentially capable of directly measuring a broad range of economic benefits for a wide range of goods, including those not yet supplied, in a manner consistent with economic theory" (Mitchell and Carson, 1989, p. 295). Moreover, the National Oceanic