



Improving the management of Taiwanese fishery resource conservation zones based on public perceptions and willingness to pay for ecosystem services

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Abstract

Marine ecosystems provide many services and benefits that directly or indirectly affect human welfare, and designating an marine protected area (MPA) is one of the management strategies for conserving marine ecosystem services. In Taiwan, 28 fishery resource conservation zones (FRCZs, one type of Taiwanese MPA) have been established since 1976, and two FRCZs in Yilan were selected as case studies for this research. Interviews and questionnaires were used to collect primary data, and then we employed factor analysis to determine what elements influence the perception of ecosystem services, and we also evaluated the respondents' willingness to pay (WTP). The empirical results indicated that supporting services are the most important to the people in the study sites, followed by provisioning services. Ecosystem services can be divided into four major categories including ecological and educational services, provisioning services, regulating services and recreational services, and in this study, ecological and educational services accounted for the largest proportion of the perceived benefits. The perception of and WTP for ecosystem services are significantly different across socio-economic backgrounds. According to the findings of this research, government agencies need to adopt the ecosystem service concept; invest in improving the efficiency of management measures, such as ecological and environmental monitoring; develop eco-tourism and conduct environmental education and outreach; and establish an FRCZ fund to enhance financial sustainability.

Keywords Public perception · Ecosystem services · Fishery resource conservation zone · Non-market valuation · Marine protected area

Introduction

The concept of ecosystem services can be incorporated into ecosystem management to improve the sustainability, efficiency and equitability of environmental decision making, and it is essential for understanding the

resulting social, economic and environmental impacts (Beaumont et al. 2007). The marine protected area (MPA) is one of the tools available as part of an ecosystem approach to the management of marine resources (Kidd et al. 2011), so MPAs are generally established in many countries. At the Earth Summit in 1992, the Convention on Biological Diversity (CBD) was developed, and it encourages the establishment of protected areas to promote biodiversity conservation. Furthermore, the World Summit on Sustainable Development emphasized the need to promote ocean conservation by “developing and facilitating the use of diverse approaches and tools, including the establishment of MPAs consistent with international law and based on scientific information, including representative networks by 2012” (UN 2002). Since then, many countries have announced projects related to the planning and management of MPAs. Currently, Taiwan has five types of MPAs for the conservation of living marine resources

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